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Water Resources Survey

Part I:

HISTORY OF LAND AND WATER USE ON IRRIGATED AREAS

Park County, Montana

Published by
STATE ENGINEER'S OFFICE
Helena, Montana, December, 1951

WATER RESOURCES SURVEY

PARK COUNTY
MONTANA

Part I

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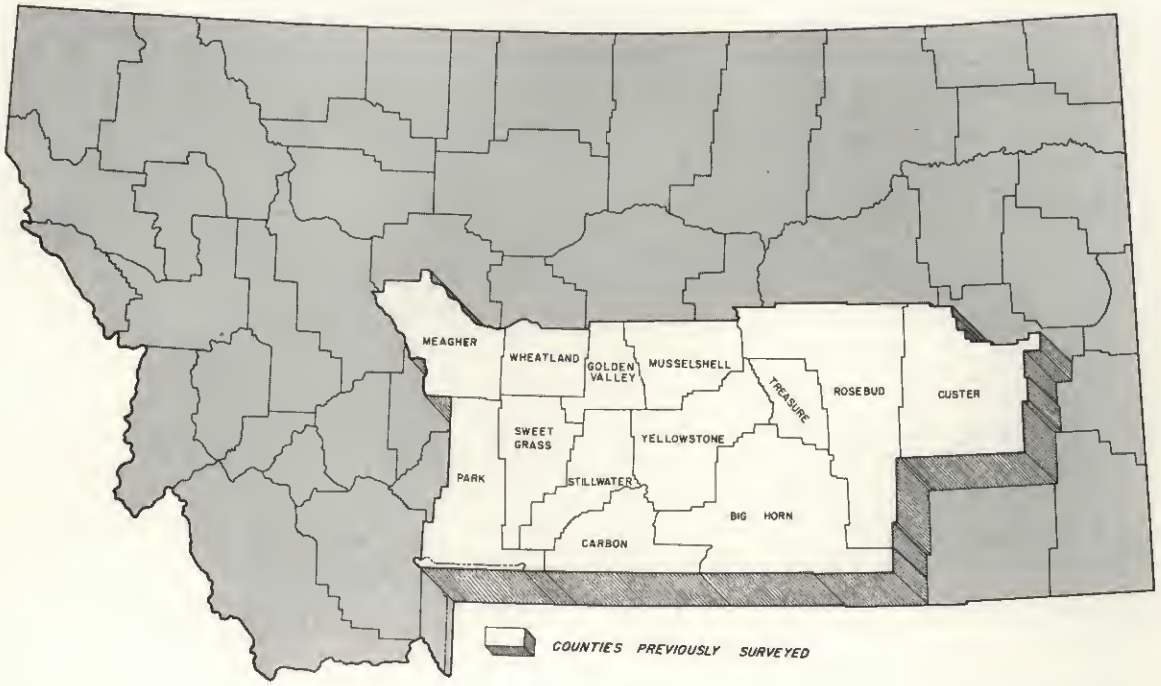
on Irrigated Areas



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STATE ENGINEER'S OFFICE

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O. W. Monson, Irrigation Engineer, Consultant and Project Leader, Bozeman

December, 1951

Honorable John W. Bonner
Governor of Montana
Capitol Building
Helena, Montana

Dear Governor Bonner:

Submitted herewith is a consolidated report on the Water Resources Survey of Park County, Montana.

This work is being carried on with funds made available to the State Engineer by the 32nd Legislative Session, 1951, and in cooperation with the State Water Conservation Board and the Montana State Agricultural Experiment Station.

The report is divided into two parts. Part I consists of history of land and water use, irrigated lands, water rights, etc., and Part II contains all of the township maps in the county showing in color the lands irrigated from each source or canal system.

Work has been completed and reports are now available for the following counties: Yellowstone, Carbon, Stillwater, Big Horn, Custer, Rosebud, Musselshell, Golden Valley, Wheatland, Meagher, Sweet Grass, Park and Treasure.

The office files contain minute descriptions and details of each individual water right, water and land use, etc., which are too voluminous to be included herein. These office files are available for inspection to those who are interested.

The historical data contained in this report can never become obsolete. If new information is added from time to time as new developments occur, the report can always be kept current and up to date.

Respectfully submitted,

FRED E. BUCK, State Engineer

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ACKNOWLEDGMENTS

A survey and study of water resources involves many phases of both field and office work in order to gather the necessary data to make the information complete and comprehensive. Appreciation of the splendid cooperation of various agencies and individuals who gave their time and assistance in aiding us in gathering the data for the preparation of this report is here acknowledged.

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Homer Mather, Commissioner
Frank Brooking, Clerk and Recorder
George W. Mason, Clerk of District Court
Arnold F. Cayser, Surveyor — J. L. Cowan, Assessor

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L. F. Gieseker—"Soils" ..... Assoc. Agronomist, Mont. Agricultural Exp. Station
Forest Keller—"Emigrant State Fish Hatchery Unit" ..... District Field Supt., State Fish and Game Dept.
A. W. Foskette—"Gallatin National Forest" ..... Acting, Forest Supervisor Forest Service
Lenix Badger ..... County Extension Agent
Frank Stermitz ..... District Engineer, U. S. G. S.
Truman C. Anderson ..... State Conservationist, S. C. S.
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Clarence Chadbourne ..... Secretary, Lower Shields Canal Co.
Edward C. Durgan ..... Secretary, Park Branch Canal
Carl Arthun ..... Secretary, Shields Canal Co.
Edward J. Jordan ..... Shields River Ranch Co. Ditch (Private)
Phil C. Holliday ..... Secretary, Upper Cottonwood Ditch Co. (Mutual)
O. Hogstad & M. Swanson ..... Yellowstone River Ditch (Decreed)

The State Engineer's Office, Water Resources Survey, hereby expresses sincere appreciation to the many ranchers, farmers, and stockmen who have given their helpful cooperation in this survey.

FOREWORD

In nearly all of the 17 Western Reclamation States a water right is obtained by first making a filing with some legally designated central state agency—usually the State Engineer's Office—setting forth the amount of water desired and the area proposed to be irrigated. A study is then made of the sufficiency of the water supply, and, if found adequate, a permit for use of the water is issued and recorded. If studies show that the stream is depleted, the application is denied. The procedure in Montana, however, is vastly different.

In Montana the right to the use of water from a stream not adjudicated by the courts may be acquired in one of two ways. First, by posting a notice on the stream and filing a copy of same in the office of the County Clerk of the county wherein the appropriation is located and then proceeding to divert and use the water. Secondly, a person may divert and use water from a stream without posting or filing notice, in which case a water right based thereon has been recognized as valid by the courts. Whenever it becomes necessary to adjudicate the stream both methods of acquiring rights have been recognized by the courts and the amount of water finally decreed and dates of priority in either case are determined by the evidences and proofs.

Under Montana law there is no restriction as to the amount of water one may designate in his notice of appropriation. As a consequence, the amount set forth in the filing in no way indicates the amount being diverted and used, nor does it show whether or not the water was ever used at all to perfect the right. Furthermore, there is no relationship whatsoever between the amount of water filed on and the normal flow of the stream. To further complicate this matter there is no law of abandonment in Montana. Action must be brought in court to abandon a right, which makes it almost impossible to prove abandonment if the defendant wishes to oppose the action.

There is no central office in the State where recordings are filed, or any supervision over the distribution of water from unadjudicated streams. The distribution of water from adjudicated streams is supervised entirely by the District Court that handed down the decree. One wishing to study the validity of a water right on a stream not adjudicated must make a search of the county records wherein the stream is located in perhaps two, three, or more counties if the stream courses through them. About the only result one will accomplish by such a research will be a tabulation of the dates of filing. The amounts of water filed on will be of no consequence, there is no conclusive evidence that the recorded appropriations have been perfected, and there is no record of the rights which are being used but never recorded. Therefore, a purchaser of ranch property, where he has to depend upon irrigation from a stream that is not adjudicated, has no way of determining the validity or priority of his water right. He has no assurance of the value of the right until the stream is adjudicated by the court, when each claimant must prove his claim by material witnesses.

The pioneers who are able to offer direct testimony in adjudication suits are rapidly passing. One phase of this Water Resources Survey is to obtain all of the first-hand information possible on water and land use from the "old-timers" who are left, before it is too late. These data will include every known water right up to the time of completing the work in the respective counties, and the information will be on file for inspection in the State Engineer's Office. At the time of this publication, work has been completed and reports are available for the following counties: Yellowstone, Carbon, Stillwater, Big Horn, Custer, Rosebud, Musselshell, Golden Valley, Wheatland, Meagher, Sweet Grass, Park and Treasure. A person

having interests in lands located in any of the above-named counties may obtain a good idea of the sufficiency and priority of the water rights appurtenant to the land in question after studying the records.

In this and succeeding volumes of the data compiled by this Water Resources Survey, it is the intention to provide as much information as is possible relative to the water right records of the various counties, as well as to assemble such other information as may be available from all sources having knowledge of these various water rights. Every precaution is being taken to avoid errors in the compilation of these data.

The results of this work, in the counties affected, proved to be very valuable and necessary in negotiating the Yellowstone River Compact between the states of Wyoming, North Dakota, and Montana. In arriving at an equitable division of the waters between the states, it was necessary for Montana to have a catalog of its irrigated land and water use. This same question will undoubtedly arise in other river basins. It is highly important that Montana gather such data, and thereby be able to defend its water rights in the development of the great river basins of the Missouri and Columbia rivers and the international streams between Canada and Montana.

The subject of water rights is coming more and more into prominence as the rapid expansion of our irrigated area proceeds under the impetus of both State and Federal development programs. As new canals are dug and old canals and ditches are enlarged and extended, the relative area of land to be irrigated, compared to the water supply available for irrigation, becomes greater, and a competition for the limited water supply results, which often develops into controversy over the right of use of the water.

In a strict sense a water right does not imply ownership of the water in the same way as does a deed to a tract of land or a certificate of title to an automobile. A water right implies only the right to divert and use the water. Water when stored in a reservoir, however, is recognized as real property which may be sold or disposed of as desired by the owner. The ownership of the water of our rivers and streams rests in the State and the rules under which the State grants to the individual the right to use these waters are known as Water Right Laws.

The early settlers in Montana took up land under the provisions of the Homestead Law of 1862 and the Desert Land Act of 1877. The former Act gave 160 acres of land to anyone who settled on it and put it into cultivation. The latter deeded 640 acres of land to anyone who would irrigate it and pay the government $1.25 per acre. In 1890, filings under the Desert Land Act were reduced to 320 acres. The construction of ditches on desert claims was in compliance for title to land rather than for irrigation, and little attention was paid to the water supply available. Consequently, miles of ditches were dug in Montana through which little or no water ever flowed. This is especially true in the drier parts of the state, where the diversions were made from intermittent streams.

In the more fertile mountain valleys irrigation was given more importance than in the plains country. Live streams provided a dependable source of water supply and the ditches which tapped them were designed to actually carry water, not merely to comply with a legal requirement to obtain title to a piece of land. Thus, the right to diversion and use of water for irrigation became as important as the acquisition of title to the land.

But, while the government granted a patent deed as evidence of title to the land upon proof of compliance with the Homestead Laws, there was no deed, certificate of title, or other legal instrument offered as evidence of title to a water right.

Water rights refer also to uses other than those for irrigation. Thus, the perfected right to the use of water for mining, power, fish hatcheries, bird refuges, recreational purposes, municipal needs, culinary supply and sewage disposal, manufacturing or navigation—all may become valid water rights.

The first irrigators took for granted their right to use water from creeks or rivers for irrigation. They saw water going to waste and appropriated it to their needs. It was as free to them as the air they breathed. They made no official record of the game they shot for food or the fish they caught in the streams and likewise considered it unnecessary to make official record of the time, place, or the amount of water diverted for irrigation. However, time has changed these conditions and it is now necessary to record the game killed and limit the fish catch in order to perpetuate game, and stock the streams. Likewise, it is becoming more and more necessary to file a claim for water appropriated from the streams and rivers for irrigation or other uses in order to protect the rights.

When game was plentiful, no one concerned himself with the number of deer a person killed, but when game became scarce, steps were taken to prevent a few persons from taking more than their share while others had to go without. To do this it became necessary to issue licenses or permits to kill game and also to keep a record of game killed—a practice which is still followed.

Likewise, when only a few settlers diverted water for irrigation and the supply was more than enough for all, no one was concerned about the exact amount used by any one person. But as more and more settlers constructed diversion dams and ditches and tapped the rivers and streams for irrigation water, it soon became evident that there would not be enough water for all. Thus, a year with low water brought about disputes over the division of the supply. The older settlers, in such cases, demanded that the later comers close down their headgates and refrain from taking water, in order that the prior appropriations might have a full supply. The later users, on the other hand, insisted that the available supply be divided among all users so that all might share alike.

Thus, progressive over-development of irrigation, together with the occurrence of seasons of water shortage, combined to bring about the enactment of Water Right Laws in the Western States where irrigation is practiced.

METHOD OF SURVEY

Data incorporated in this report were obtained by both the office and field survey method in cooperation with the irrigators on the land.

First, ownership plats were made up from the Courthouse records, after which field forms were prepared for each owner as they appeared on the plats, showing the name of the owner, aerial photograph number and farm boundary. The appropriated and decreed water rights that fall within the ownership boundary were also platted on this field form. Both the appropriated and decreed water rights were checked with the ownership and deeds in the Courthouse records to determine, if possible, the name of the present day water user. All the water right information was listed on the field form and later verified by the water user in a farm by farm survey.

For all irrigation systems, water users were asked specific information as to the source of water, present acreage irrigated, potential irrigable acreage under existing works, seeped acreage, condition of irrigation system, type of system and water supply.

The information in regard to the location of the irrigation system, present irrigated and potential irrigable lands under existing works, was indicated on aerial photographs, with the exact location of each shown, and the various systems distinguished by color.

The data obtained by the field survey was mapped on township maps from the aerial photographs by means of projection. In addition to the information pertaining to irrigation, all culture, drainage, section lines, etc. were mapped in order to make complete and authentic township plats for the area concerned. This information was then mapped by farm units on individual farm forms that show the farm boundary, the location and type of irrigation system, location of irrigated and potential irrigable lands under the system, present irrigated acres, potential irrigable acres under existing works, type of system, source of water, etc. After these farm unit forms were completed, a summary was made of each township, which shows the name of the water user, section, township and range, source of water, whether a user has a private irrigation system or is under a ditch company or irrigation district, acres irrigated from each source, present irrigated acres, potential irrigable acres under existing facilities, and maximum irrigable acres. The summary given in this report was tabulated from these township summaries to show the totals for the county.

After this was accomplished and a final check made, color separation maps were drawn which included from three to ten separation plates, depending on the number of colors that appear on the final township map in Part II of this report.

Section and township corner locations were obtained by the photogrammetric system, based on Government land office maps, county maps, plane table sheets and other sources.

So far as known this is the first survey of its kind ever to be consummated in the United States. The value of this work has been well substantiated by giving Montana its first accurate and verified information concerning its water use and resources under existing irrigation facilities. New lands to be developed by State and Federal construction agencies are not within the scope of this report. No effort has been made to analyze economic possibilities, or the problems of the irrigated projects, or to make recommendations as to their future development. The facts

presented are as found at the time of completing this report and provide the items and figures from which a detailed analysis of water and land use can be made.

The historical data contained in this report can never become obsolete. If new information is added from time to time as new developments occur, the report can always be kept current and up to date.

GENERAL INFORMATION ABOUT

PARK COUNTY

HISTORY AND ORGANIZATION

On a sparkling morning in July, 1806, a little group of travel-worn explorers stood on the summit of Bozeman pass near the western border of present Park county and gazed with relief on Yellowstone valley stretching away at their feet. They were the first white men ever to penetrate the region, but to Captain William Clark, of the Lewis and Clark expedition, the valley meant the beginning of the end of a most momentous trip.

The next visitor to the section was John Colter, who spent a little time in 1807 rustling Indian fur trade for Lisa's post at the mouth of Big Horn river, and then Jim Bridger, who passed a winter with Indians in Emigrant gulch 38 years after Clark.

Following a brief visit by Lieutenant Maynadier to the southern part in 1859, James Stuart's Yellowstone expedition, out of Bannock in 1863, retraced a part of Clark's old trail gathering valuable information of the little known wilderness. The same year Thomas Currie found pay dirt in Emigrant gulch, and with a few companions settled down to match wits with the unfriendly Crows.

Blazing an overland route to western gold camps, John Bozeman reached the site of Livingston in July, 1864, with an emigrant train of 40 wagons, some of which dropped out to re-enforce the miners in the gulch. On the heels of Bozeman came Bridger and Jacobs with a large combined train which also left its quota. Additional re-enforcements were received from succeeding trains, and by the fall of 1864, 200 people were panning gravel in Emigrant or prospecting in the vicinity. Then, when the first snow flurries heralded the approach of winter, practical Thomas McGronigle announced his intention of remaining, "snows or Crows to the contrary notwithstanding," and erected a log cabin at the mouth of the gulch. His example was immediately followed by others, and Yellowstone City, now a ghost town, entered upon its short existence.

In 1870, Dr. J. A. Hunter established himself at the hot springs he had discovered six years before, and opened the sanatorium that has since become well known. The following year a Northern Pacific survey crew ran lines easterly through the district and in 1872 the first privately owned store was erected by Benson and Nailly at Benson's Landing. In the meantime rich silver ore had been discovered at Cooke, in the southeastern corner of the county, and a rude smelter erected by Gassert and Redding. Among early residents of this community were J. E. Mushback, Jack Allen, N. J. Tredennick and Frank C. Byrne.

The town of Livingston, named for Director Crawford Livingston of the Northern Pacific, was surveyed in November, 1882, and had a population of about 500 before December. It first consisted of a dozen buildings of what might be termed permanent construction and about 120 tents and temporary shelters, but it was well supplied with hotels, restaurants, stores and saloons. A postoffice in charge of Mr. Phillips, and a school under the direction of Miss Allen rounded out a community whose health was ably guarded by Dr. Campbell.

The railroad reached the town in December, 1882, and was turned over to the operating department January 15, 1883. Then came the boom. Farmers and stockgrowers swept into

the territory, prospecting and mining took on added impetus, towns appeared, and Livingston, headquarters for the Montana division of the road, experienced a growth which was phenomenal.

Gardiner, at the main entrance to Yellowstone Park, came into existence in 1883. It was reached by the railroad a year or two later when the Park branch was constructed from Livingston, opening the upper Yellowstone valley as well as affording easy access to the Park. It may be stated in passing that one of the engineers in charge of construction of this branch was the late Hon. Charles H. Loud of Miles City.

Agitation for a new county began immediately with the coming of the railroad, but Gallatin, of which the district formed a part, opposed the idea and with such effect that a bill presented in the legislature of 1883 was accorded a prompt and courteous funeral. Whereupon petitions for creation of a county of Park, signed by nearly every resident of the proposed county, were filed in congress in April, 1884. That body took no action, and the fight was again carried to Helena, where, in 1885, a bill to incorporate eastern Gallatin as Bridger county occasioned a bitter legislative battle which ended with Bridger a casualty and Gallatin still intact. It was the last straw. When the legislature again convened, in 1887, a bill to create the county of Park, named for Yellowstone Park, was introduced with all the outraged sentiment of Livingston and vicinity behind it, this strangely modern spectacle of comparatively small organized minority enforcing its will upon a large section of the populace came to an end. Governor Preston H. Leslie signed the bill February 23, and the new subdivision, including most of present Sweet Grass and Stillwater and parts of Golden Valley and Carbon, was organized in May, with the county seat at Livingston.

Census figures for 1950 credit Park County with a population of 11,999, ranking it 14th among counties of the state. With an area of 2,627 square miles it ranks 22nd in the state. The county is approximately 78 miles from north to south and 60 miles from east to west in its extremities, but due to its irregular shape it does not embrace the area that these figures would indicate. It is bordered on the west by Gallatin County, on the north by Meagher, Sweet Grass and Stillwater counties, on the east by Sweet Grass and Carbon counties, and on the south by Yellowstone Park.

TRANSPORTATION

Park County has excellent transportation facilities. The main line of the Northern Pacific Railroad crosses the county from east to west, a branch line runs north to Wilsall, and the Yellowstone Park Branch of the Northern Pacific runs south to its southern terminus at Gardiner. Northern Greyhound Bus Lines provide service for the area with several daily schedules, and the Northern Pacific also provides bus service to some portions of the county. Livingston is the junction point of U. S. Highway 10 and U. S. Highway 89 which pass through the county from east to west and north to south respectively.

The county has within its bounds two entrances to Yellowstone Park. The northeast entrance at Silver Gate is the terminus of U. S. Highway 12, more commonly known as the famous "Cooke City Highway," which crosses over the top of the Beartooth Mountains and offers scenic grandeur that is unsurpassed. The north entrance, Park headquarters, at Gardiner, is the only entrance that is kept open all year. Usually the road is kept open to Cooke City, and during the winter months this entrance opens up a winter wonderland that is beyond description. An excellent system of secondary and county roads provides year round access to the main highway and marketing areas which provide outlets for the livestock and agricul-

tural products raised in the county. Livingston is the trading center for the county, and although there is an airport located just out of Livingston, the residents of the county must travel to Bozeman, 26 miles to the west, to obtain airline facilities serving all points.

CLIMATE

As usual in the more mountainous areas of Montana, Park County experiences extreme variations in nearly all phases of climate. The Yellowstone Valley itself is noted for strong winds and warmer than the usual Montana wintertime average temperatures, while along the southern edge of the county on the northern fringe of Yellowstone Park, there are large sections at high elevations which experience very cold winter weather with heavy snowfall. In general, the agricultural areas of the county are characterized by periods of very strong southwest winds, semi-arid rainfall, wide ranges in temperature, but plentiful sunshine and quite stable temperature conditions during July and August.

The Livingston weather record is the only one in the county of sufficient length to furnish dependable climatic data, but there are a few years of readings from the Northeast Entrance to Yellowstone Park which offer some estimate of conditions in the higher area on the south edge of the county. Precipitation varies widely at Livingston from year to year; from the greatest, 25.79 inches in 1925 to the least 8.07 inches in 1934. The annual average for all years through 1944, is 14.38 inches. The months producing most rainfall are May and June, with a minor peak in September. The last killing frost occurs at Livingston on May 17th on the average, and the first frost in the fall averages on September 21st, giving a normal frost-free season of 127 days. Frost-free seasons are little, if any, longer than this elsewhere in the Yellowstone Valley, and are likely to be much shorter in southern parts of the county. The mean annual average temperature for Livingston is 45.9°, as compared to the state average of 43.2°. The normal average for January is 25.4°, in July, 68.6°. Highest ever recorded at Livingston was 106° in July, 1901; the lowest, -45° in February, 1946. Most years have extremes well inside these values, which of course have occurred only once in 42 years.

By way of comparison, in the few years of records at Yellowstone Park Northeast Entrance, the highest temperature has been only 92°, while the lowest was -50°, in January, 1951. The few years of precipitation record indicate annual rain and snowfall totals a liquid amount of about 26 or 27 inches—nearly double that of Livingston. Average temperature, too, has run on the annual basis about 10° colder than Livingston, indicating an annual normal of around 36°. Livingston is at an elevation of 4,485 feet, while the Northeast Entrance station is at 7,200 feet. Recent weather station additions at Wilsall, and rain gages at Clyde Park, Livingston 10S, Emigrant, Corwin Springs, and Jardine have not yet produced enough records to be significant. Because so much of Park County is at a relatively high elevation, much of the area has a climate with decidedly mountainous characteristics.

SOILS

Most of Park County is mountainous. The agricultural lands are confined to (1) high bottomlands in the stream valleys of the Yellowstone and Shields Rivers, (2) benches and fan terraces bordering these valleys, (3) tablelands on the lower mountain slopes, and (4) gently rolling upland tracts in the northern part of the county. The arable lands lie chiefly in the Chestnut and Chernozem soil zones at comparatively high elevations where the temperature conditions are favorable for the accumulation of organic matter in the surface soil and where the rainfall in most places is sufficient to leach the more soluble mineral salts from the soil

body. Successful irrigation of these lands require adequate drainage, natural or artificial to prevent water logging of much of the irrigated areas. Some soils of high salinity are found in the northern part of the county and occasionally in the Yellowstone and Shields river valleys east of Livingston.

The basin through which the Yellowstone River flows in the vicinity of Pray and Emigrant is eight or more miles wide. It merges into Yankee Jims Canyon to the south, and into the Lower Canyon above Livingston to the north. The upper part of the basin south of Pray has been glaciated. Much of the land south of Emigrant and on the mountain slopes about Emigrant and Pray has a low hummocky relief and the soils are very gravelly and stony. Since the time of glaciation, the Yellowstone River has widened its valley and the side streams have built up coalescing fan terraces which extend down to the poorly drained flood plains of the river in many places. The soil types predominating on the high bottomland along the river and on the lower part of the fan terraces are loams and silt loams with varying contents of gravel and cobbles, and on the higher part of the fan terraces chiefly stony loams. Most of this part of the basin has an elevation of over 5,000 feet above sea level. The growing season at this elevation is comparatively cool and short and the crops grown are chiefly early maturing varieties of small grains and forage crops that require 90 to 100 days to mature.

North of Emigrant the Yellowstone River meanders in a poorly drained, stony flood plain along which lie high bottomlands. Smooth, gently sloping fan terraces extend down from the mouth of the stream canyons to the river valley in most places and along the valley often have the relief of benches. The soils of the high bottomlands and on the fan terraces do not vary greatly from those in the upper part of the basin. Nearly all the soils contain varying quantities of gravel and cobbles. Most of this part of the basin lies several hundred feet lower than the upper part of the basin and the crops grown are largely the early maturing varieties of small grains and forage crops.

The West Boulder River and its branches drain a high glaciated basin having a hummocky relief and dark colored medium textured stony soils. The smoother and less stony irrigated and non-irrigated lands are devoted mainly to the production of wild and tame hay to support a livestock industry.

The Shields River Valley consists largely of a stony flood plain along which are locally distributed high bottomlands and low benches. The soils on these bottomlands and benches have a wide range in texture and usually contain a fair amount of gravel in all sections.

The character of the soils in the Yellowstone River Valley east of Livingston to Mission Creek depends upon location in reference to the stream. South of the poorly drained, stony flood plains of the stream, the floor of the valley rises to the south in a series of low gravelly terraces lying below a high stony fan terrace extending back to the mountains. North of the river and west of Shields River wash from the adjacent Livingston geologic beds cover the gravel deposit, and the soils are mainly clay loams and silty clay loams containing more or less gravel. The high bottomlands in this part of the valley are under irrigation and are devoted to the production of irrigated small grains and forage crops. East of the mouth of Mission Creek the Yellowstone River Valley narrows, and west of Springdale it becomes a gorge. A few high bottomlands, on which are medium textured soils, are found in this part of the valley and also along Mission Creek.

Rock, Cottonwood and other creeks heading in the Crazy Mountains are intrenched in high tablelands—some of which extend down from the mouth of the canyons to the Shields

River Valley. Except for terraced slopes along the streams, these tablelands have smooth surfaces and gradients of 60 or more feet to the mile. Dark brown and very dark brown loams and silt loams, grading locally into stony loams, predominate. The lower subsoils of these soil types are stony and gravelly with the interstitical space between the stone and gravel filled with gray limy fine earth for several feet. The irrigated and non-irrigated lands are devoted to the production of small grains and forage crops up to elevations of 5,300 to 5,400 feet in elevation, above which wild and tame hay are largely grown.

Dry land farming is carried on locally on the deeper and more friable dark brown and very dark brown upland soils west of Clyde Park and Wilsall, and also east of Wilsall. In many places, the land under cultivation occurs on slopes where colluvial-alluvial and wind borne materials have accumulated on interbedded sandstones and shales of the Livingston formation. The arable soils range in texture from gritty loams to friable silty clays. Small grains and feed crops are chiefly produced.

Much of the area west of the Shields River Valley and also east of this valley below the high tablelands is rough broken land suitable only for the grazing of livestock. Small isolated irrigated and non-irrigated tracts occur along some of the upland streams. Feed and forage crops are largely produced on the tracts.

CROPS

About half of the land in Park County is devoted to crop production. Of the 1,681,280 acres of land in the county, 841,104 acres are classed as farm land. There are 564 farms in the county with an average of 1,491 acres per farm. Approximately 55,460 acres are under irrigation with the bulk of this land lying in the Yellowstone River Valley and the Shields River Valley. The balance is widely scattered throughout the county and consists mostly of small parcels. Despite the fact that cash crops are of minor importance, the farm and ranch income for crops sold in 1951 was $1,192,101.00 as compared to the total agricultural income of $4,766,761.00 for the year.

The principal crops grown in the county are winter wheat, spring wheat, oats, barley, alfalfa hay, grass hay and a small amount of seed peas. The majority of the hay and a portion of the grain is utilized for feeding and wintering the livestock produced in the county, with the balance sold for cash crops.

Crop yields are generally very good throughout the county. Some difficulty in harvesting has been encountered in the Upper Shields River Valley for the past two years due to excessive moisture in the fall of the year and early snows.

Approximately 100,000 acres of land in the county are devoted to the raising of dry land grains whose yields are considered very good due to the relatively high annual rainfall, most of which occurs during the growing season.

LIVESTOCK

The livestock industry is the major source of income in Park County, with cattle predominating. Livestock sales in 1951 amounted to $3,314,774.00 with $2,364,796.00 of this income resulting from cattle and calves sold. The sheep population is at an all time low with many of the ranchers turning to cattle. In 1935, the sheep and lambs numbered 135,000 head compared with 30,897 head in 1951. There are approximately 38,633 head of cattle in the county consisting of herefords, angus and shorthorn in that order. In addition, there are about 3,000

head of registered beef cattle made up of these three major breeds. Horses, mules, hogs and poultry sales amounted to $197,044.00 last year and dairy products sales amounted to $224,-438.00 for the year.

The livestock raised in the county is of exceptionally high quality as there is usually an abundance of summer feed available within the four ranges of mountains located in the county. The ranchers in the area are able to raise ample livestock feed for winter use. Grazing land comprises a total of 605,649 acres.

Like most of Montana, severe winters are the rule rather than the exception in Park County but ranchers of the area are usually well provided with feed to carry the livestock through the winter. The topographical nature of the land provides a modicum of protection from the weather due to the rough terrain found over most of the county and due to the fact that large areas are timbered.

WATER SUPPLY

The principal streams from which water is diverted for irrigation purposes in Park County are the Yellowstone River, the Shields River, the West Boulder River, and their tributaries. The main diversions from the Yellowstone River are the Livingston Ditch, Park Branch Canal, and Hunter's Hot Springs Canal Company. Diversions from Mill Creek, a tributary to the Yellowstone, are private diversions consisting of the Carter, Upland, Mill Creek Flat Ditch, and many smaller private ditches. These ditches go together to form a system providing water for a large area in that portion of the county.

The principal diversions from the Shields River and its tributaries are the Lower Shields River Canal Company Ditch and the Shields River Ranch Ditch from the Shields River; the Shields Canal Company Ditch from Flathead Creek; and the Upper Cottonwood System from Cottonwood Creek. These systems cover large areas and are supplemented by many smaller private ditches. The Shields River Ranch and Cottonwood systems are private or mutual ditches as distinguished from ditch companies.

Topographically, a major portion of Park County consists of rugged mountainous terrain with vast watersheds and drainages. This report lists some of the larger tributaries to the above mentioned streams and those tributaries which rise in the county having waters used for irrigation purposes. The accompanying map book, Part II, provides detailed information on all of the drainage in the portion of the county which is mapped.

Yellowstone River

The headwaters of the Yellowstone River are located in northwestern Wyoming, a considerable distance above Yellowstone Lake. The lake, which many people commonly mistake for the headwaters of the Yellowstone, provides a large natural reservoir covering 142 square miles which serves to distribute the outflow to the river throughout the summer months without artificial regulation. From the lake, the river flows north and west passing through the Grand Canyon of the Yellowstone and thence to the southern boundary of Park County near Gardiner, Montana. It continues in a northwesterly direction for about 25 miles and then swings northeast to Livingston where it makes a large bend and flows in an easterly direction to the east boundary of the county near Springdale.

The important tributaries to the Yellowstone are as follows: Gardiner River, Stevens, Reese, Tom Miner, Donahoo, Big, Dry, Sheep, Strickland, Pole Gulch, Eight Mile, Trail, Miner,

and Fleshman Creeks from the west; Bear Gulch, Eagle, Little Trail, Bassett, Cedar, Slip and Slide, Dailey, Six Mile, Emigrant, Mill, Elbow, Strawberry, McDonald, Pine, Poole, Deep, Suce and Cline Creeks from the east; Mission Creek from the south; and the Shields River, Dry, Cottonwood, and Dog Creeks from the north.

Shields River

The Shields River headwaters are in the northeast corner of Park County. The river flows to the west for about twelve miles, thence southerly for about twelve miles, and thence southeasterly for about twenty-two miles to its confluence with the Yellowstone River just east of Livingston. The principal tributaries are as follows: from the north and west, Dugout, Spring, Lodge Pole, Meadow, Smith, Spring, Cole, Flathead, Antelope, Brackett, Canyon, Bangtail, Kay, Willow and Crazyhead Creeks; from the south and east, Turkey, Scofield, Clear, Hell Roaring, Bennett, Serrett, Deep, Mill, South Fork Shields, Bear Gulch, Porcupine, Elk, Daisy Dean, Horse, Big and Little Indian, Dry, Cottonwood, Rock, Chicken, Tobin, Falls and Adair Creeks.

Boulder River

The Boulder River flows in and out of Park County along the east boundary line, and as no irrigation water is derived for use in this county the river will be discussed in the Sweet Grass County report.

West Boulder River

The West Boulder River headwaters are about 30 miles southwest of McLeod, Montana in the eastern portion of Park County. The stream has several small tributaries in the county but practically all of the irrigation water in that area is diverted from the river or comes from springs which are abundant in the area.

Stillwater River

The Stillwater River, which plays an important part in Sweet Grass County irrigation, has its source in the extreme southeastern portion of Park County about 10 miles south of the county line between Park and Sweet Grass counties, but like the Boulder River it has no irrigation users in Park County.

In concluding the water supply report for Park County, it may be stated that the supply is usually adequate to serve most of the irrigated land in the county. Proper conservation and reclamation measures will eventually bring considerably more land under irrigation and assure sufficient water to those lands already under irrigation. Farmers in the area fully realize the importance of a reliable water supply and are constantly improving their systems to that end. The economic future of Montana depends to a great extent upon the future development of its water resources, and it is apparent that the residents of Park County are prepared to do their part in the over-all plan to assure this future.

STREAM GAGING STATIONS

The United States Geological Survey carries on the work of measuring stream flows in cooperation with funds supplied by the State and several Federal agencies. The results are published yearly in book form, but the last book published for the Missouri River Basin is the year 1948. The following data on individual streams therefore covers the respective periods

from the beginning of measurements up to September 30, 1948, and computed on the water years, which begin October 1 and end September 30 of the following year.

The following equivalents may be used in converting from one unit of measurement to another:

(a). In Montana, one cubic foot per second equals 40 miner's inches.
(b). One acre foot is the amount of water required to cover an acre one foot deep.
(c). One cubic foot per second will nearly equal two acre feet (1.983) in 24 hours.
(d). A flow of 100 miner's inches will equal five acre feet in 24 hours.
(e). One miner's inch flowing continuously for 30 days will cover one acre 1½ feet deep.

Yellowstone River. Records of stream flows so far as they effect Park County are as follows:

Yellowstone Lake at Lake Hotel, Yellowstone Park.
Yellowstone Lake outlet in Yellowstone Park.
Yellowstone River near Canyon Hotel, Yellowstone Park.
Yellowstone River at Horr (near Corwin Springs).
Yellowstone River at Corwin Springs.
Yellowstone River near Livingston.

Tower Creek at Tower Falls, Yellowstone Park.
Lamar River near Tower Falls, Yellowstone Park.
Blacktail Deer Creek near Mammoth, Yellowstone Park.
East Fork of Blacktail Deer Creek, Yellowstone Park.
Gardiner River near Mammoth, Yellowstone Park.
Lupine Creek near Mammoth, Yellowstone Park.
Bear Creek at Jardine.
Mill Creek near Pray.

A staff gage is located on Yellowstone Lake at the boat dock 1,500 feet southwest of Lake Hotel. Datum of the gage is 7,729.45 feet above sea level. Records are available since October, 1921. The maximum gage height observed was 6.26 feet on July 9 and 10, 1943, and the minimum was -0.1 feet on December 7 and 8, 1931. Records are not available for the winter months.

The gage at the outlet of Yellowstone Lake is located 550 feet below the Fishing Bridge. Records have been kept continuously since December, 1922, but the records prior to 1926 were gage heights only. The maximum flows have varied from 311 to 7,420 second feet while the minimums have ranged from 252 to 665 second feet. The yearly flows in acre feet have varied from 493,000 to 1,370,000; and in second feet, from 682 to 1,890. The highest water comes in June and July and the lowest in the winter months, December through March.

One half mile above the Upper Falls is the Canyon Hotel gage. Continuous records are available since June, 1913, except that no records were kept for the winter months. The highest water comes in June and July, ranging from 533 to 8,550 second feet. Minimum or winter flows have not been measured.

The gage at Horr is 6 miles below Gardiner. Records are available from August, 1889 to October, 1893. The flow is equivalent to that at Corwin Springs, two miles downstream.

A gage is located at the highway bridge at Corwin Springs, eight miles below Gardiner where continuous records are available since September, 1910. The maximum flows have

varied from 472 to 26,500 second feet, while the minimums range from 389 to 11,600 second feet. The yearly flows in acre feet varies from 1,378,000 to 3,040,000. Highwater comes the last of May and all of June. Lowwater is the winter months, December through March.

On the highway bridge five miles south of Livingston is a gage where records are available from May, 1897 to December, 1905, August, 1928 to September, 1932, and March, 1938 to September 30, 1948, the last date of published records. Maximum flows have varied from 825 to 29,800 second feet while minimum flows vary from 590 to 13,590. The yearly discharge ranges from 1,760,000 to 4,150,000 acre feet. With the exception of four years, the highest flows have been in June.

Yellowstone River

	Drains Sq. Mi.	Yrs. of Record	Annual Mean Ac. Ft.	Annual Mean Sec. Ft.	Second Feet Maximum	Second Feet Minimum
Lake Outlet	1,010	22	893,100	1,232	7,420-6/7/27	200-12/17/36
Canyon Hotel	1,160	36			8,550-6/27/18	
Horr	2,630	4	2,077,000	2,865	15,500-7/92	285- 4/15/91
Corwin Springs	2,630	38	2,154,000	2,979	26,500-6/18	389- 2/ 3/37
Livingston	3,580	22	2,609,400	3,602	30,600-6/20/43	590- 1/22/40

Records of tributaries to the Yellowstone River that are in the Park are as follows:

Tower Creek drains 51 square miles. Records are available from September, 1922 to September, 1943 and then discontinued. Average annual discharge for the 14 years was 51.5 second feet. The maximum discharge observed was 642 second feet (5/30/25) and the minimum 5.6 second feet (3/17/34). The records are poor.

Lamar River drains 640 square miles. Continuous records are available since September, 1922 with the exception of many missing winter records. The average annual discharge for the twelve years is 812 second feet. The maximum flow recorded was 13,600 second feet (5/25/28) and the minimum 40 second feet (3/16/45).

Blacktail Deer Creek drains 14.8 square miles. Records are available from November, 1937 to November, 1945 when the station was discontinued. The maximum discharge recorded was 168 second feet (6/1/43). At times there were no flows on account of ice.

East Fork of Blacktail Deer Creek drains 10.3 square miles and the record is short, from November, 1937 to September, 1938.

Gardiner River drains 201 square miles. Records are available from September, 1922 to October, 1938 at a site 1¼ miles above the mouth of Boiling River, which is an outlet channel from Mammoth Hot Springs. At a new site ¾ miles below the mouth of Boiling River, continuous records are available since October, 1938. The two sets of records are not comparable. At the lower site, the average annual discharge for the ten years has been 198 second feet, or 143,300 acre feet. The maximum flow was 1660 second feet (June 20, 1943) and the minimum 35 second feet (March 28, 1942).

The mean annual discharge for the 13 years of record at the upper station was 158 second feet with a maximum of 1790 (5/28/28) and a minimum of 31 second feet (4/7/28).

Lupine Creek drains 4.6 square miles. Records are available from November, 1937 to October, 1941 when the station was discontinued. The maximum discharge for the period was 36 second feet (6/5/38) and the minimum 0.4 (1/30/38, 12/24/39). The mean annual flow was 2410 acre feet.

Records of Bear Creek at Jardine began October, 1946 and the station was discontinued in 1949. No record is given of the drainage area. The mean annual flow for 1947 and 1948 was 48,415 acre feet. The maximum flow was 520 second feet and the minimum 5.18.

The station on Mill Creek was started in March, 1951. It is located 4½ miles southeast of Pray.

Shields River. Gaging stations in the Shields River Basin, Park County, are as follows:

Shields River near Wilsall
Shields River at Clyde Park
Brackett Creek near Clyde Park
Bangtail Creek at Chadbourn

The upper gaging station is located at the county bridge about 13 miles northeast of Wilsall. No drainage area is given. Continuous records are available from May 10, 1935 to September 30, 1948, the last published reports. There are several small irrigation diversions above the station. The maximum discharge has varied from 233 (May, 1939) to 1600 (June, 1948) second feet, while the minimum has ranged from 3.5 (December, 1937) to 10 second feet (December, 1946, Jan., Feb., March, 1947). The mean annual discharge averages 42,660 acre feet, or 59 second feet.

The Clyde Park station is located at the highway bridge ¾ mile west of town. The drainage area is 544 square miles. Records are available from March, 1921 to September, 1923, April, 1929 to December, 1932, and February, 1934 to September, 1948. There are no winter records for the first two years and records for numerous months of 1932-1934 are missing. There are many irrigation diversions above the station. The annual flow has varied from 33,510 (1934-35) to 255,200 acre feet (1947-1948), with an annual average of 103,900 acre feet. The maximum flow varies from 268 second feet (1935) to 4,450 (1943), while the minimum ranges from 1.8 (1935) to 40 second feet (1946).

Brackett Creek flows into the river about two miles below the Clyde Park station. The present gage is 4 miles above the mouth of Brackett Creek. The original gage was ¾ mile farther upstream. No drainage area is given for either location. Records are available for the upper station from March, 1921 to September, 1923, and for the lower station from April, 1934 to September 30, 1948. There are many small diversions for irrigation above the gage. The average discharge for the 14 years of record has been 27.6 second feet, or 20,000 acre feet. The maximum discharge recorded was 1,400 second feet on May 22, 1948, while the minimum was 0.6 second feet on December 27, 1943.

The gage on Bangtail Creek is just above the mouth of the creek half a mile northwest of Chadbourn. Records are available from March to June, 1923. During this period the greatest discharge observed was 88 second feet and the minimum 1.5 second feet. There is a total of 1,945 miner's inches of decreed rights diverted above the gage.

West Fork of Boulder River

There are two gaging stations on the west fork of Boulder River—one near Bruffeys and the other at McLeod. The upper station drains an area of 94 square miles, while the station at McLeod has a drainage area of 137 square miles. The Bruffey records run from May, 1904 to August, 1910 and the McLeod station from May, 1907 to July, 1914. There are some irrigation diversions above both gages. A good many records are missing for winter months at both stations. The maximum daily discharge at Bruffeys was 1,610 second feet (June 18, 1904) and the minimum was 20 second feet at several different dates. Due to the absence of winter records the yearly run-off in acre feet cannot be given at either station. At the McLeod station the maximum run-off observed was 1990 second feet on June 17, 1909.

MINING

The history of mining in Park County is largely the record of discovery and development of mineral deposits in the Jardine and New World (Cooke) districts. Placer gold was first found by George Phelps in gravels along the Yellowstone River near Gardiner in 1862. In 1866, placer gold was found near the mouth of Bear Gulch. A continuing search for the origin of these placer deposits finally was rewarded in 1870 when gold quartz veins were discovered at the present site of Jardine. The Jardine district has been comparatively active since discovery, with the exception of an extended period of litigation from 1909 to 1916 and a shutdown from 1926 to 1932. It is noteworthy that a tungsten mineral was recognized in the Jardine ores in 1904 when several shipments of hand-sorted scheelite ore were made to Germany. These shipments are among the earliest recorded for domestic tungsten production. In 1904, a cyanide plant was added to the Jardine milling facilities, which were further improved by the installation of flotation equipment in 1922. Operations were suspended in 1942 by Federal restrictions on gold mining. Increasing war demands for arsenic, however, led to the reopening of the property, which later operated uninterruptedly to May, 1948, when the cyanide plant was destroyed by fire.

Exploitation of the New World district near Cooke City was intensified in 1882, when the area was withdrawn from Indian lands and opened to settlement. A lead smelter and roasting furnace were erected and successfully operated for a short period on ores from the Republic vein. Prohibitive freight rates on base bullion forced the termination of operations in 1887. Continued prospecting in the New World district during the succeeding years resulted in a few shipments of lead-silver ores. In the early 1900's, attention was directed to the district's pyritic-gold-copper ores. After an interval of promotions and reorganizations, the Western Smelting & Power Co. constructed a 250-kilowatt hydroelectric plant to supply energy for a 350-ton copper smelter erected in the upper Clark Fork Basin. A long adit designed to develop ores exposed on Henderson Mountain failed in its objective and the operation terminated. The smelter, which was never "blown in," has been largely dismantled in recent years. The hydroelectric plant is in ruins.

In 1920, exploration proceeding under the direction of L. H. Brooks resulted in the location and development of the Irma property on Republic Mountain. This operation has continued to the present time as a small but consistent producer of lead and zinc concentrates.

In 1933, claims on Red Mountain were acquired by the McLaren Gold Mines Co. A concentrator, later destroyed by fire, was completed in 1934. McLaren Gold Mines Co. stock was purchased by the Newmont Mining Corp., and in 1939 considerable exploratory core drilling

was done. The stock was resold to McLaren Gold Mines Co., and Newmont's interest in the property terminated. The concentrator was rebuilt, and the open-cut mining of low-grade pyritic-gold-copper ores was continued by the McLaren Gold Mining Co. The operation has since been expanded considerably and milling facilities have been improved. It now is one of the State's important gold-copper producers.

In 1942, an urgent war-born demand for optical-grade calcite led to the opening of several deposits in the vicinity of Wilsall, Clyde Park, and Springdale. An intensive program of exploration and development jointly sponsored by the War Production Board and the Bureau of Mines resulted in the production of a quantity of acceptable, optical-grade material.

Large-scale placer operations were attempted at Emigrant, Montana, in 1941, when a 10-cubic foot Yuba dredge was installed by the Emigrant Dredging Co. of Kansas City, Mo. Operations were suspended in 1942 because of Federal restrictions on gold mining but resumed in 1946. Because of difficult ground and its low gold content, the operation was terminated in 1948. The dredge has been dismantled and sold.

A great number of small-scale placer operations have been undertaken along the Yellowstone River, in Bear Gulch near Jardine, at Crevasse Mountain, and in areas within and adjacent to the New World district. These operations were characteristically short-lived; their aggregate production over the years was of only minor importance.

Dependable statistics from the year of county organization in 1887 to 1947, inclusive, indicate that Park County has produced base and precious metals valued at $8,114,000. Although placer gold accounts for 12 percent of this metal output, about 77 percent of the total production during the period was recovered in gold from lode mining. The combined value of lode and placer gold output therefore, is, about $7,251,000, or 89 percent of the county's total metal production. The total value of silver, copper, lead, and zinc produced has amounted to $864,-000, or nearly 11 percent.

Although placer gold was first discovered in the Park County region near Gardiner in 1862, no reliable record of metal-mining operations or production is available for the period 1862-1886. Due to the complete absence of authentic data, no estimate of metal production for this interval has been attempted. It is believed, however, that the total metal production for this earlier period probably did not exceed $500,000 in value.
(Bureau of Mines Information Circular 7546)

SOIL CONSERVATION DISTRICTS

A Soil Conservation District is a legal subdivision of the State, established by the farm and ranch owners and operators, which permits group action in dealing with the problems in soil erosion, moisture conservation, soil fertility, and land use.

The Montana State Soil Conservation District Law was passed by the 26th General assembly on February 28, 1939, and gives the authority for organizing Soil Conservation Districts within the State. Under provisions of the Law, no district can be formed unless the people want it, nor unless they register this want; first by petition, and later by a favorable vote of at least 65 percent of the qualified voters in the proposed district. The law also provides for

the formation of a State Soil Conservation Committee, which assists in the organization of districts and also in securing cooperation from state and federal agencies.

The main governing body of a Soil Conservation District is the board of five supervisors who are elected by the people of the District. This board is empowered by the law to study the conservation problems of the district and to formulate programs to deal with these problems. This Board may call upon local, state and federal agencies to assist in executing the districts program, and by applying to the Board of Supervisors, farmers and ranchers may obtain such technical assistance as the District may have without expense to the operator. The use of other facilities, such as earth-moving equipment, owned, leased or contracted by the District is made available at rates fixed by the Board of Supervisors.

In the State at the present time there are 56 Soil Conservation Districts organized, and 23 Cooperative State Grazing Districts receiving technical assistance from the Soil Conservation Service in conducting conservation programs.

SHIELDS VALLEY SOIL CONSERVATION DISTRICT

The Shields Valley Soil Conservation District was voted into existence by the land owners and tenants on April 30, 1949. The district includes all of that portion of Park County lying north of the mouth of the Shields River, and that part of Gallatin County lying east of the Bridger Range that drains into the Shields River Basin. The district comprises about 572,162 acres and includes approximately 355 farm and ranch units in Park County.

The Supervisors of the district were organized in October of 1949 and operate independently of the Federal Government in administering the affairs of the district. They have a working agreement with the U. S. Department of Agriculture that provides for technical assistance and heavy equipment which the district could ill afford to maintain on its own. These technicians conduct soil, topographical, forage and other studies in the district in order to get basic land facts for use in establishing good sound conservation measures from which the individual farmer and the entire district will derive the most benefit.

The district's annual work plans have stressed guidance in proper use of the land presently available, establishment of sound conservation measures on these lands, and future measures designed to bring more land under development. The district has been in operation slightly over two years and according to present estimates less than 2% of the proposed projects have been completed to date. Work done so far has consisted primarily of the following developments: improving irrigation systems, construction of stock water reservoirs and storage dams, land leveling and drainage projects on irrigated lands, and seepage areas. Other programs include stubble mulching, improved grazing plans for range improvement, weed control crop rotation, seeding, proper stocking practices, and streambank erosion control. A 1,200 foot flood control dike to prevent streambank erosion and flooding of adjacent lands was constructed by the Corps of Army Engineers working in cooperation with the district last year on the Shields River.

During the last year the district purchased a phosphate drill and a sagebrush eradication machine which will be available to the farmers and ranchers in the district on a rental basis. A 35 mm. camera has also been purchased to help out in the educational programs planned for the district. Now that the plan is under way future development of the various projects will be

limited mainly by the financial ability of the farmers and ranchers under the district to develop their lands. The program is gaining momentum constantly and plans for the future look very promising.

EMIGRANT STATE FISH HATCHERY UNIT

In the extra legislative session, 1918, Mr. Joe Brooks, State Representative from Park County, introduced a bill in the State Legislature to create a Fish Hatchery at Emigrant, Montana. In the following regular session, 1919, the State Legislative Body passed the bill to create the hatchery. Lt. Governor Nelson Story donated the site to be used by the Department of Fish and Game as long as they wished for that purpose, and when they ceased to use the site for a Fish Hatchery it would revert back to his estate.

In the summer of 1919 construction and operation was started. It was the third fish hatchery built in the State. At that time John Harold Brunson was State Superintendent of Fisheries and John W. Schofield was foreman of the Emigrant hatchery. The hatchery contained 12 troughs measuring 16′ by 14″ by 10″ originally, along with 2 small outside concrete raceways 3′ wide and 60′ long side by side, then below these ponds 3 or 4 dirt raceways about 3′ wide and 60 to 80′ long. The water started in the hatchery and then passed through all the ponds. With the aid of these troughs and ponds, approximately 2 million 1½-inch fish could be produced annually. Continued use of water through these small ponds did not prove too successful.

In 1930, the Fish and Game Commission bought a new hatchery site from A. W. T. Anderson, located a few miles from Emigrant and across the Yellowstone River. This site had a better water supply and much more room for rearing facilities, therefore, in November of 1930, Ben Crenshaw, a contractor from Bozeman, moved the Emigrant Hatchery buildings to the new site. The hatchery building was made larger so as to have 20 hatching troughs in it as well as a feed room and grinding room. Four cement ponds 6′ wide and 60′ long were also constructed. In 1933, 2 rock riprapped dirt ponds were built by the W.P.A. 90′ by 50′, and 40′ by 80′. In 1938, a large pond 342′ long and 42′ wide was built, with the Park County Rod and Gun Club supplying some of the labor, and the next year, in 1939, two more large dirt ponds were built. In 1948, four cement ponds 10′ by 100′ were built in place of the 40′ by 80′ rock riprapped pond, and 10 cement ponds were built in the hatchery to take the place of the 20 hatching troughs. One of the most important improvements made was a 5 ton cold storage unit, which was added to the plant in 1949. The unit is of a large capacity and permits the storage of different kinds of food for a great length of time. This enables the hatchery to buy food at times when it is available, at a lower cost, thus making a saving which in time will pay for the unit.

All of the above improvements were made to facilitate maximum fish production at minimum cost, to secure proper stocking of waters consistent with use and demand, and to stock larger fish. Due to the cold water at the Emigrant Station, fish have to be held longer in order to get proper growth.

In 1941, Raymond M. West, Jr., Biologist, U. S. Department of Agriculture, in cooperation with Art Allen, hatchery employee acting for Elmer G. Phillips, Montana State Superintendent of Hatcheries, hatchery foremen, forest rangers, sportsmen, Game Wardens of drainage areas, and others interested in fish management, drew up a five-year fish distribution and management plan wherein the hatchery output was proportioned among the watersheds and points of stocking and species were established. Each hatchery adhered to this plan as closely as

possible, and facts, such as the adaptability of a certain species, were learned. Upon expiration of the first five year distribution and management plan, another similar five year plan was introduced and accepted. In 1950, the plan was revised to take care of changing conditions.

The Emigrant hatchery, under the able administration of the present foreman, Mr. George Miller, is responsible for the Smith River Drainage in Meagher County, the Shields River Drainage, the Cooke City Area, the Yellowstone River Drainage from Tower Falls in Yellowstone National Park to the mouth of the Shields River, and the Lamar River Drainage.

Some of the above waters are in Yellowstone National Park, therefore, the Emigrant State Fish Hatchery cooperates with the Park Service in stocking fishing streams in that area.

Present output of the Emigrant Hatchery is around 250,000 4½ to 7-inch fish, 100,000 2-inch fish, 800,000 1½-inch fish and 300,000 1-inch fish of the following species: Loch Leven, Eastern Brook, Rainbow and Native Trout. The smaller fish are planted in virgin waters or in headwaters where predators are at a minimum, and at times when pack strings are available for transportation to the more remote areas.

Preliminary investigations have been started by Mr. Miller in an attempt to secure more water that is available in the vicinity. If more water can be obtained, increased production will be assured with the existing facilities.

GALLATIN NATIONAL FOREST

Yellowstone, Shields, and Gardiner Ranger Districts

The Yellowstone, Shields, and Gardiner Ranger Districts of the Gallatin National Forest are in Park County, Montana. They include the Yellowstone River and its tributaries from Livingston south to Gardiner, the Absaroka Primitive Area, which lies along the northern boundary of Yellowstone National Park from Gardiner and Jardine eastward to Cooke City, and the Shields River and its tributaries from the Yellowstone River north to Ringling. The major part of this area, or approximately 700,000 acres, is in Park County. This constitutes an important segment of the County and contains great natural resources which must be safeguarded and adequately administered. Some of the outstanding resources are watershed, timber, wildlife, and its habitat; range for domestic stock, and recreational opportunities for thousands of people.

Of great interest and prime importance is the actual condition of the watershed on this wild land, for it is from these watersheds that water is derived for livestock, irrigation, power, and household use within, around and far below the Gallatin National Forest. The district rangers strive to maintain or increase the watershed efficiency by close supervision of all activities within their districts. All land uses have an impact on the watershed, and all administration must be keyed to its preservation and improvement.

Forest fires destroy timber, livestock forage, game habitat, and recreation facilities, but the main, long-range effect of forest fires is the destruction of the water-holding capacity of the watershed. Ranger districts maintain written fire-prevention and fire-control plans. These plans are coordinated annually with neighboring districts, national forests, and with Yellowstone National Park. Fire tool caches are maintained at strategic points throughout the forest. Rancher cooperators and sawmill operators are furnished fire-fighting equipment and given

authority to hire men for fighting forest fires within their respective areas. Fire schools, attended by Forest Service personnel and local cooperators are held each spring where fire prevention and fire control methods are demonstrated and discussed. The final day at each school is devoted to the actual control and "mopping up" of a training fire set on a spot where the clean-up affected will be an added benefit to the training.

Timbered areas in Park County are largely confined to national forest and Northern Pacific Railroad Company lands. Timber is limited to the mountain slopes, usually from timberlines downward for about 2,500 feet in elevation. The principle tree species are Lodgepole Pine and Douglas Fir. Admixtures of Engleman Spruce will be found on the moist locations and Juniper on the drier sites. White-barked Pine is common at highest elevations and groves of picturesque Aspen, varying from isolated clumps to extensive acreages add to the variety and color of the forest cover.

Timber stands of commercial value for logging occur mostly on the lower, less precipitous mountain slopes where more sheltered areas of favorable soil depth are found. Due to the absence of roads into the majority of these timber stands a relatively small portion of the forest growths has been harvested. Quite recently a more intensive use of this timber has begun because Lodgepole is attaining a value for pulpwood. The small amount of timber used by local ranchers and sawmills prior to pulpwood cutting has not been enough to utilize annual forest growth. If the present high demand for wood products continues, and all indications are that it will, it is probable that most areas bearing commercially valuable timber will be harvested repeatedly and indefinitely on a system of cutting, which will remove the current growth and at the same time improve the watershed, reduce the fire hazard, and add to the value of forested properties for general public benefit.

Timber prices paid to the Government for wood products are determined by competitive bidding except in the case of very small purchases. In common with receipts from other forest uses, timber sales help the County governments financially. Twenty-five percent of these proceeds are returned to the counties for schools and roads. Payment to Park County for the fiscal year ending June 30, 1951 was $9,383.59 and the cumulative total paid to the County since 1908 is $129,798.73.

National forest timber lands, being largely undeveloped, are constantly subject to damage by insects and disease. Many of the trees are old and have lost the vigor needed to resist disease and repel insect attacks. At present, there are no seriously damaged areas or attacks of epidemic proportions in Park County. There is, however, little protection against such damage except by expensive, large-scale spraying operations. For this reason, vigilant watch is kept by forest officers so that attacks by insects or disease may be discovered before they attain large proportions.

Wildlife population on the Gallatin National Forest are generally on the increase. A recent wildlife population estimate, made by the district rangers, places game numbers on the Forest at 60 antelope, 690 black bear, 73 grizzly bear, 10,170 mule deer, 6,277 elk, 813 moose, 162 mountain goats, and 222 Bighorn sheep. Approximately fifty percent of these animals are recorded on the three ranger districts in Park County. Excellent fishing waters abound on these three districts, as is the case in the rest of the Forest. In behalf of this public asset, forest rangers serve as deputy state game wardens without pay.

Habitat requirements vary with each species of native game animals and each condition exists on national forest lands in Park County. Swampy meadows with acquatic vegetation

are important for moose, as are a profusion of palatable browse for deer and grassy ridges for elk. Of the game animals listed in the population estimate, over ninety percent of their forage comes from the national forest and most of the game ranges are in good condition.

The grazing of domestic stock on the Gallatin National Forest is an important use and should be classified as sheep grazing and cattle grazing since different systems of management govern the two uses. At the present time, approximately 500,000 acres of national forest land in Park County is useable to livestock and about 400,000 acres are being used for this purpose. During the year 1951, 3,700 cattle and 16,000 sheep were grazed on the national forest in Park County. The weight put on by these animals while on the national forest represents a definite economic asset to surrounding communities.

The land ownership pattern on the Gallatin National Forest is complicated because Northern Pacific and other private lands are intermingled with national forest lands in a checkerboard fashion. This situation increases the difficulty and cost of grazing administration. It does not, however, have a seriously adverse effect on land use because cooperation between the permittees, land owners, and the Forest Service is extremely good.

Regular inspections of the ranges are made by forest officers and the permittees to check sore spots caused by accelerated erosion which is usually due to concentrated grazing, trampling in wet weather, and unpermitted use by trespass livestock. These inspections also contribute to the most efficient use of national forest forage. Every precaution is taken to maintain and, if possible, improve the grazing lands which are a very important part of the watershed. Range conditions on forest ranges in Park County are generally good, although there do exist small overgrazed areas—local areas where accelerated erosion is taking place—but the total acreage in this class is small.

Developing and maintaining suitable recreational facilities on the Shields, Yellowstone and Gardiner districts is another important Forest Service responsibility in Park County. On national forest lands in the County, eighteen summer homes and three resorts have been constructed under special-use permit. Permits are also in effect on seventeen pastures, twelve drift fences, and ten water transmission projects.

There are twelve improved campground and picnic areas free to the public on national forest land in Park County. These grounds, capable of accommodating a combined total of 550 people at one time, are maintained by the Forest Service to the best standards possible under existing Congressional allotments.

To properly administer the resources on national forest lands in Park County, workers and administrators must have means of travel and communication. For this reason, 89 miles of road, 1,082 miles of trail, and 38 miles of telephone line are maintained by the Forest Service in the County. While not their primary purpose, these facilities serve the public when for any reason it is desired to travel through the national forest.

Forest Service aims are to beneficially use all resources of the national forests to the fullest extent possible but in so doing to: (1) Maintain and increase watershed efficiency through supervised logging and grazing and through control of fire and erosion; (2) Maintain and, if possible, improve livestock ranges; (3) Protect wildlife habitat; and, (4) Safeguard appropriate recreation sites so that recreation facilities may some day be developed to a point consistent with the need. The overall aim is to attain integrated, multiple use of all forest resources on the basis of sustained yield for all time.

SUMMARY OF IRRIGATED LAND BY RIVER BASINS IN THE FOLLOWING COUNTIES COMPLETED TO DATE

Big Horn, Carbon, Custer, Golden Valley, Meagher, Musselshell, Park, Rosebud, Stillwater, Sweet Grass, Treasure, Wheatland, and Yellowstone

RIVER BASIN	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
Missouri River Drainage Basin			
***Missouri River**	3,657	1,290	4,947
Smith River	30,304	18,398	48,702
Musselshell River	64,789	57,870	122,659
Total	98,750	77,558	176,308
Yellowstone River Drainage Basin			
Yellowstone River	223,357	52,550	275,907
Shields River	29,252	6,850	36,102
Big Timber Creek	10,378	9,234	19,612
Boulder River	13,415	2,742	16,157
Sweet Grass Creek	18,594	23,006	41,600
Stillwater River	11,661	3,459	15,120
Rosebud River	15,828	12,944	28,772
Clark's Fork River	33,286	7,328	40,614
Rock Creek	58,482	16,867	75,349
Big Horn River	48,261	15,735	63,996
Little Big Horn River	17,134	9,844	26,978
Tongue River	22,137	7,479	29,616
Powder River	8,264	1,804	10,068
Grand Total Yellowstone River Basin	510,049	169,842	679,891
Grand Total Missouri River Basin	98,750	77,558	176,308
Grand Total in the counties completed to date	608,799	247,400	856,199

It was necessary to cover 12,818,862 gross acres in the above basins in order to complete the survey.

*Names of streams indented on the lefthand margin indicate that they are tributaries of the first stream named above which is not indented.

IRRIGATION SUMMARY OF PARK COUNTY BY RIVER BASINS

	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
REGULAR IRRIGATION—Yellowstone River Basin			
*Yellowstone River	9,464	3,270	12,734
Bear Gulch or Creek	3	0	3
West Fork Bear Creek	0	5	5
Bear Gulch, Springs & Eagle Creek (mingled water)	72	14	86
Park Lake Creek and Van Dyke Reservoir	96	0	96
Eagle Creek	3	20	23
Stevens Creek & Wilson Springs	67	0	67
Reese Creek	551	0	551
Little Trail Creek	105	0	105
Bassett Creek	66	20	86
Mulherin Creek	295	70	365
Unnamed Spring	12	0	12
Deaf Jim Creek & Hoppe Creek (mingled water)	55	0	55
Mill Creek	102	1	103
Lyon Hollow Creek	169	0	169
North Fork Lyon Hollow Creek	46	0	46
North Fork Dixon Creek	100	0	100
North Fork Dixon Creek & Cottonwood Creek (mingled water)	134	0	134
Cedar Creek	237	0	237
First Creek & Second Creek (mingled water)	68	0	68
Little Slip and Slide Creek	15	0	15
Slip and Slide Creek	50	0	50
Tom Miner Creek	588	30	618
Trail Creek	12	0	12
Dry Creek	75	0	75
Sheep Creek	0	5	5
Scully Creek	287	0	287
Pine Creek	85	0	85
Sharpe Creek	62	0	62
Gulch Creek	72	21	93
Horse Creek	607	0	607
East Fork Horse Creek	66	0	66
Middle Creek	32	0	32
Reeder Creek	10	0	10
Lee Creek	64	0	64
Canyon Creek	23	0	23
Rock Creek	104	0	104
Unnamed Spring	20	0	20
Donahoo Creek	189	15	204

*Name of streams indented on the lefthand margin indicate that they are tributaries of the first stream named above which is not indented.

IRRIGATION SUMMARY OF PARK COUNTY BY RIVER BASINS

	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
(Yellowstone River) Continued			
Big Creek	868	235	1,103
Lewis Creek	15	0	15
Mill Creek	0	0	0
Hyalite Creek & Mill Creek (mingled water)	0	2	2
Hyalite Creek	115	0	115
Hyalite Creek & Dry Creek (Trib. to Yellowstone) (mingled water)	58	0	58
Dry Creek	50	20	70
Dailey Creek	9	0	9
Garden Creek or Lakes	100	0	100
Garden Creek, Sheep Creek & Dailey Creek (mingled water)	110	0	110
Six Mile Creek	582	0	582
Gold Run Creek & Last Chance Creek (mingled water)	8	0	8
Emigrant Creek	567	69	636
Strickland Creek (Upper)	968	5	973
Eight Mile Creek	252	0	252
Mill Creek	3,255	100	3,355
West Fork Mill Creek	62	0	62
East Fork Mill Creek	0	12	12
Upper Sage Creek	35	0	35
Counts Creek	8	0	8
Davis Creek and Springs	505	5	510
Elbow Creek	1,070	10	1,080
Strawberry Creek	484	100	584
McDonald Creek	420	0	420
South Fork McDonald Creek	220	215	435
Cascade Creek	220	15	235
Joe George Creek	14	0	14
Barney Creek	15	0	15
Pine Creek	1,672	15	1,687
Deep Creek	441	133	574
North Fork Deep Creek	1,148	84	1,232
South Fork Deep Creek	747	467	1,214
Unnamed Spring	106	0	106
Unnamed Spring	38	14	52
Spring Creek	702	0	702
Suce Creek	502	14	516
Mill Fork Suce Creek	66	12	78
Unnamed Spring	2	0	2

IRRIGATION SUMMARY OF PARK COUNTY BY RIVER BASINS

	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
(Yellowstone River) Continued			
Suce Creek and North Fork Deep Creek (mingled water)	94	0	94
Trail Creek	1,043	25	1,068
Strickland Creek	13	0	13
Bullis Creek	35	0	35
Unnamed Springs	64	9	73
Dry or Cline Creek	28	23	51
Billman Creek	344	122	466
Quinn Creek	29	0	29
Unnamed Springs	21	0	21
Hopper Creek	135	0	135
Spring Creek	30	0	30
O'Rear Creek or Area Creek	154	3	157
Miner Creek	127	53	180
Eldridge Creek	68	0	68
Fleshman Creek	347	259	606
Perkins Creek	44	45	89
Unnamed Spring	2	0	2
Chicken Creek	62	0	62
Ferry Creek	26	60	86
Poison Creek	4	0	4
Shields River	7,005	284	7,289
South Fork Shields River	637	44	681
Smith Creek and Springs	261	0	261
Meadow Creek and Spring	287	0	287
Bear Gulch	47	0	47
Kavanaugh Creek	25	0	25
Kavanaugh Creek and Shields River (mingled water)	496	0	496
Porcupine Creek	193	124	317
Middle Fork Porcupine Creek	310	30	340
Lena Creek	26	0	26
Spring Branch Lena Creek	28	0	28
Lena Creek & North Fork Lena Creek (mingled water)	25	0	25
Elk Creek	16	0	16
North Fork Elk Creek	1,047	0	1,047
South Fork Elk Creek	275	174	449
Unnamed Spring	20	0	20
Dry Creek	45	142	187
Daisy Dean Creek	391	217	608
South Fork Daisy Dean Creek	93	0	93

IRRIGATION SUMMARY OF PARK COUNTY BY RIVER BASINS

(Yellowstone River)	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
(Shields River) Continued			
North Fork Daisy Dean Creek	0	25	25
Flathead Creek	2,786	737	3,523
Little Muddy Creek	10	85	95
Ash, Shaffer, or Timber Creek	63	18	81
Big Muddy Creek and Reservoir	616	32	648
Potter Creek	0	0	0
Spring Creek	0	34	34
Little Cottonwood Creek	568	144	712
Flathead Creek and Antelope Creek (mingled water)	24	4	28
Horse Creek	554	20	574
South Fork Horse Creek	175	0	175
Middle Fork Horse Creek	50	0	50
North Fork Horse Creek	317	58	375
Unnamed Spring	0	1	1
Big Indian Creek	0	27	27
Little Indian Creek	34	176	210
Antelope Creek	45	32	77
Unnamed Coulee	0	12	12
O'Leary Creek	0	44	44
Cottonwood Creek	5,085	1,466	6,551
Unnamed Spring	1	0	1
Brackett Creek	844	282	1,126
Miles Creek	23	15	38
Fox Creek or Spring Creek	0	26	26
Sheep Creek	0	23	23
Spring, Harvey or Burnt Timber Creek	96	16	112
Canyon Creek	181	92	273
Rock Creek	5,117	1,560	6,677
Little Rock Creek	0	267	267
Hammond Creek	48	0	48
Rock Creek and Tobin Creek (mingled water)	105	36	141
Chicken Creek	108	0	108
Bangtail Creek	243	250	493
Tobin Creek	139	0	139
Unnamed Spring	1	0	1
Kay Creek	15	0	15
Willow Creek	207	0	207
South Fork Willow Creek	41	23	64
Middle Fork Willow Creek	55	30	85
South Fork and Middle Fork Willow Creek (mingled water)	36	0	36

IRRIGATION SUMMARY OF PARK COUNTY BY RIVER BASINS

	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
(Yellowstone River)			
(Shields River) Continued			
North Fork Willow Creek	51	94	145
Falls Creek	170	67	237
Adair Creek	22	21	43
Mission Creek	1,327	562	1,889
Unnamed Springs	29	0	29
Little Mission Creek	0	0	0
Unnamed Springs	3	3	6
Rock or Bullis Creek	6	0	6
Beaver Creek	16	0	16
Locke Creek	0	0	0
Davis Lake	0	9	9
Greeley Creek	2	26	28
Peterson Creek	26	0	26
Hunters Creek	306	108	414
Dog Creek	3	18	21
Cold Spring or Cottonwood Creek	27	0	27
Duck Creek	0	0	0
West Fork Duck Creek & Rock Creek (mingled water)	131	70	201
West Fork Duck Creek	330	611	941
Lowell Creek	42	0	42
Unnamed Spring	0	4	4
Boulder River	0	0	0
West Boulder River	23	114	137
Unnamed Springs	0	11	11
Nuttal Creek	46	0	46
Elges Creek	3	3	6
Total in Yellowstone River Basin (Regular)	63,487	13,868	77,355

REGULAR IRRIGATION—Missouri River Basin

Missouri River	0	0	0
Gallatin River	0	0	0
East Gallatin River	0	0	0
Rocky Creek	0	0	0
Jackson Creek or Middle Creek	35	0	35
Total in Missouri River Basin (Regular)	35	0	35
Grand Total Regular Irrigation	63,522	13,868	77,390

IRRIGATION SUMMARY OF PARK COUNTY BY RIVER BASINS

	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
FLOOD IRRIGATION—Yellowstone River Basin			
Yellowstone River	0	0	0
Tom Miner Creek	0	0	0
Gulch Creek	12	0	12
Elbow Creek	114	0	114
McDonald Creek	0	0	0
Barney Creek	9	0	9
Deep Creek	96	10	106
Billman Creek	0	0	0
Unnamed Coulee	0	6	6
Sulphur Spring Gulch	0	22	22
Fleshman Creek	0	0	0
Unnamed Coulee	0	39	39
Dry Creek	0	21	21
Ferry Creek	0	37	37
Poison Creek	6	12	18
Shields River	22	0	22
Smith Creek	51	25	76
Kavanaugh Creek	0	0	0
Spring Creek & Springs	0	25	25
Elk Creek	0	0	0
South Fork Elk Creek	0	0	0
Dry Creek	34	0	34
Horse Creek	0	0	0
South Fork Horse Creek	12	0	12
Middle Fork Horse Creek	33	0	33
Cottonwood Creek	14	28	42
Crazy Head Creek	4	0	4
Mission Creek	0	0	0
Beaver Creek	8	8	16
Hunters Creek	0	0	0
Unnamed Coulee	0	7	7
Total in Yellowstone River Basin (Flood)	415	240	655
Grand Total of Regular and Flood Irrigation (Yellowstone and Missouri River Basin) in Park County	63,937	14,108	78,045

HUNTER'S HOT SPRINGS CANAL COMPANY

The Hunter's Hot Springs Canal Company was formed on October 9, 1907 by Andrew M. and Julia B. Clark, and W. D. and Maggie McKenzie for the purpose of supplying stockholders and other consumers with water from the Yellowstone River for irrigation and other useful and beneficial purposes. Provisions were made for appropriating and acquiring water rights, and construction of the necessary canals and appurtenances. The Company was incorporated for twenty years with a capital stock of $37,800, which was divided into 63 shares, having a par value of $600 each. The number of shares actually subscribed was 33 1/3. On April 5, 1929, approximately two years after the expiration of the corporation charter, the Company was re-incorporated under the same name for a term of forty (40) years. The capital stock of $37,800 was divided into 63 shares having a par value of $600. The number of shares actually subscribed was 33 5/6 and in 1951, 62 23/24 shares were subscribed.

Four notices of appropriation were filed by Andrew M. Clark and W. D. McKenzie for waters from the Yellowstone River to be conveyed in the Hunter's Hot Springs Canal Company Ditch to and upon lands lying in Township 1 South, Range 12 East; Township 1 South, Range 13 East and Township 1 North, Range 13 East. The first appropriation for the system was made October 30, 1897 for 1,000 miner's inches and filed November 19, 1897; the second appropriation was made June 1, 1899 for 1,000 miner's inches and filed on June 19, 1899; the third appropriation was made May 13, 1901 for 1,500 miner's inches and filed June 1, 1901; the fourth appropriation was made June 2, 1902, for 2,000 miner's inches and filed June 3, 1902. The first and second notices of appropriation are on file in Book 3 of Water Right records on Pages 60 and 155 respectively, in the Park County Courthouse. The third notice of appropriation is on file in Book 7 of Miscellaneous Records on Pages 557-558 in the Park County Courthouse. The fourth notice of appropriation is on file in Book 18 of Water Right records on Page 161 in the Sweet Grass County Courthouse.

The Hunter's Hot Springs Canal ditch begins at a point approximately 1 mile southwest of the town of Springdale in Park County, Montana. The canal diverts water by gravity from the Yellowstone River by means of a rock and concrete diversion wing and concrete headgate on the north bank near the north line of the northwest quarter of the northeast quarter of Section 28, Township 1 South, Range 12 East in Park County. The ditch traverses in a northerly and slightly easterly direction to the Sweet Grass County line and then takes a more easterly course. The point of termination is near the center of the north line of the northeast quarter of Section 25, Township 1 North, Range 13 East in Sweet Grass County.

Most of the irrigated and irrigable land lies in Sweet Grass County, with 26 acres irrigated and 27 irrigable acres located in Park County at the present time. (For map see Part II, Page 22). Further information may be had on this canal system by consulting Part I, Water Resources Survey report of Sweet Grass County.

ARTICLES OF INCORPORATION

of

HUNTER'S HOT SPRINGS CANAL COMPANY

KNOW ALL MEN BY THESE PRESENTS: That we, W. D. McKenzie, Julia B. Clark, A. M. Clark, Carl Myrstol, and L. P. Officer, being stockholders of a corporation of the same name, the charter of which has expired, do by these presents pursuant to and in conformity with the laws of the State of Montana, associate ourselves together to establish a corporation and do hereby adopt the following Articles of Incorporation.

ARTICLE I

The name of this corporation shall be "Hunter's Hot Springs Canal Company."

ARTICLE II

The purposes for which said corporation is formed are as follows: to appropriate and acquire water and water rights, irrigating ditches and the appurtenances thereof, and to construct ditches for irrigating and other useful and beneficial purposes; which water and water rights are to be and will be appropriated and acquired from the water of the Yellowstone River in Park County, Montana, and to be diverted and taken out of said river on its north bank at a point in the northwest quarter of the northeast quarter in Section 28, Township 1 South, Range 12 East, M.P.M. in Park County, Montana; such water, water rights, irrigation ditches and the right-of-way therefore are and shall be for irrigation, domestic, agricultural, mechanical and other useful and beneficial purposes; to supply the stockholders and other consumers with water for irrigation, agricultural and mechanical purposes; the ditch by means of which said water and water rights are and will be diverted and conducted extends and will extend from the said point of diversion in a general northwesterly direction traversing Sections 21, 22, 15, 11 and 12 in Township 1 South, Range 12 East, and Sections 8, 7, 4 and 5 in Township 1 South, Range 13 East, and Sections 34, 35, 26, 25 and 24 in Township 1 North, Range 15 East, and will terminate at any requisite point of final discharge to supply additional lands and additional users with said water and water rights for said purposes as may later be determined; to purchase or otherwise acquire on and hold such real and personal property of every kind and description suitable, necessary, useful or advisable in connection with any or all of the objects hereinbefore or hereafter set forth and to convey, sell, assign, transfer, lease, mortgage, pledge, exchange or otherwise dispose of any of such property or of any of the water or water rights belonging to this corporation; to do each and everything necessary, suitable, useful or advisable for the accomplishment of any one or more of said objects or which shall at any time, appear to be conducive to or expedient for the benefit of said corporation in connection therewith.

ARTICLE III

The place where the principal business of this corporation is to be transacted, shall be Big Timber, Sweet Grass County, Montana.

ARTICLE IV

The term for which this corporation is to exist shall be forty (40) years.

ARTICLE V

The number of directors of this corporation shall be five (5) and the names and residences of the five who are appointed for the first three months of the existence of this corporation and until their successors are elected and qualified are:

W. D. McKenzie	Big Timber, Montana
Julia B. Clark	Livingston, Montana
A. M. Clark	Livingston, Montana
L. F. Officer	Big Timber, Montana
Carl Myrstol	Big Timber, Montana

ARTICLE VI

The Capital Stock of this corporation shall be Thirty-seven Thousand Eight Hundred Dollars ($37,800), divided into 63 shares of the par value of Six Hundred Dollars ($600.00) per share, and said stock shall be assessable. The amount of said capital stock actually subscribed by the following named persons and the amount set opposite their respective names are:

W. D. McKenzie	10 1/3 shares	$6,200.00
Julia B. Clark	3 1/3 shares	2,000.00
A. N. Clark	10 shares	6,000.00
L. P. Officer	6 2/3 shares	4,000.00
Carl Myrstol	3 1/2 shares	2,100.00

In Witness Whereof, we the incorporators have hereunto set our hand this 27th day of March, 1929.

LIVINGSTON DITCH PROJECT

The Livingston Ditch diverts water on the west bank of a side channel of the Yellowstone River about 5 miles above Livingston and near the south line of the southeast quarter of the northeast quarter of Section 11, Township 3 South, Range 9 East. The ditch runs in a north and westerly direction to within about ¾ mile of Billman Creek where it turns northeast and crosses Billman and Fleshman Creeks, thence along the northwest side of Livingston and crosses Dry Creek and Ferry Creek, still running in a general northeasterly direction to within about 1½ miles west of the Shields River where it ends.

Under the canal are two major irrigated areas. The first or upper of these areas is the Five Acre Tracts south and west of Livingston. This area is divided into small tracts usually five acres or less, most of which are owned by wage earners of Livingston. The second or lower area is north and northeast of Livingston and is composed mostly of large acreages, except for the part in the Montague addition to Livingston, which is also in small tracts of about five acres.

The canal, which is 12 miles in length, was built with a carrying capacity of 80 second feet at the intake and 23 second feet at the outlet. The headworks consist of a headgate and a concrete weir dam. The dam is 185 feet long and is provided with flashboards 2 feet high spanning 140 feet of the weir to control water diversion. The headgate structure is of concrete and is provided with two steel slide gates each 5 feet by 3.5 feet in dimension. In the ditch system there are five flumes, several hundred feet of timber lining, and about 1,000 feet of corrugated steel pipe varying from 15 inches to 48 inches in diameter. The ditch is covered for a short distance in the City of Livingston.

During the years 1949 and 1950 a wooden flume was replaced with a fill and culvert structure, 800 feet of canal was concrete lined, a street crossing built, and two railroad bridges were replaced on the project.

The first development of the ditch began about the year 1901 when the Yellowstone Valley Land and Irrigation Company was formed for that purpose. The Company later turned over all its interest in the project to the Park Irrigation Company, a Montana corporation, and by 1906 the canal was operating under this Company and was called the Park Irrigation Ditch. As such, the ditch was operated until the year 1936 when it was decided to reorganize and rehabilitate the ditch through the services offered by the State Water Conservation Board and the Federal Government's P.W.A. A loan and grant offer from the federal government, dated January 2, 1936, was received by the State Water Conservation Board and was accepted by the Board on January 7, 1936. This offer called for the construction of the project at an estimated cost of $40,000, of which $18,000 was to be a grant and $22,000 a loan to be evidenced by State Water Conservation revenue bonds, Series "G." The Board required the formation of the Livingston Ditch Water Users' Association and the sale of 2,600 miner's inches of water under contract of a form which was to be approved by the P.W.A. On May 5, 1936, the Livingston Ditch Water Users' Association was incorporated under Montana laws. The required water purchase contracts (see page 49) were then secured and approved by the Association on November 25, 1936, and after approval by the P.W.A. the contracts were approved by the State Water Conservation Board on December 5, 1936. The bond transcript was completed and after they were approved by the P.W.A., the bonds were sold to the government on March 20, 1937.

Bids for the construction of the project were received on December 23, 1935. The low bidder was J. L. McLaughlin of Great Falls, Montana, with a bid of $29,838. The State Water

Conservation Board awarded the contract to that bidder subject to approval by P.W.A., which approval was received May 15, 1936. Construction work commenced August 4, 1936, and was accepted by the Board as completed on March 20, 1937.

The funds to construct the project were secured by the State Water Conservation Board through an issue of its Water Conservation Bonds, Series "G," in the amount of $22,000, dated January 1, 1936, secured by a trust indenture of the same date, executed by the State Water Conservation Board and the Montana Bank and Trust Company of Great Falls, Montana, as trustee, wherein the revenues of the project were pledged for the payment of the interest on and principal of the bonds. These bonds bear interest at the rate of 4% per annum, payable January 1st of each year commencing with the year 1937, with first bond principal in the amount of $500.00 due January 1, 1939 and increasing annual payments to the sum of $1,000 due January 1, 1966.

In order to pay off its obligations to the State Water Conservation Board, the Livingston Ditch Water Users' Association entered into a water marketing contract (see page 48) with the Board in which the Association agreed to pay to the State Water Conservation Board the sum of $1,560.00 on November 1st of each year beginning with the year 1937 to and including the year 1965.

The water marketing contract is fulfilled by means of water purchasing contracts entered into by each individual water purchaser, the Livingston Ditch Water Users' Association, and the State Water Conservation Board. The original list consisted of 77 water purchase contracts, totalling 2,600 miner's inches of water at 60 cents per miner's inch per year, commencing with the year 1937 to and including the year 1965.

The total due under these contracts was sufficient to pay all interest and bond principal.

Through the years, several water right filings have been made for lands embraced under the Livingston Ditch. The first of these filings was made by Olaf W. Mattson for 6,000 miner's inches of the waters of the Yellowstone River appropriated August 8, 1890 and filed September 13, 1890. Another filing was made by John R. King, who filed on 500 C.F.S. of the waters of the Yellowstone River on December 14, 1900, and on May 19, 1903 a filing was made by the Livingston Land and Irrigation Company for 60,000 miner's inches of water. Part of these water rights were never proved up on but from them certain prior rights have been developed in the Livingston Ditch. These prior rights are required to pay only operation and maintenance charges on the present ditch system. The total of these prior rights, reserved at the time the State Water Conservation Board gained title to the system, was 470 miner's inches of water. In a deed on record in Book 66 of Deeds, pages 25 and 26, Park County Records, it is stated that the canal referred to as the Park Irrigation Ditch and now called the Livingston Ditch has had, since the year 1906, a capacity of approximately 500 miner's inches, and that this amount of water had been continuously used through the ditch since that time. The latest water right filing for the ditch was filed in the office of the County Clerk, as ex-officio Recorder of the County of Park, Montana, on May 1, 1936, and is recorded as Instrument No. 13721. This instrument declares the intentions of the State Water Conservation Board to appropriate 77 cubic feet per second of the unappropriated waters of the Yellowstone River and its tributaries in Montana, together with the return flow of all waters furnished or supplied by seeping or overflowing from the previous place of use of said waters.

The Livingston Ditch Project first operated during the year 1937 and has operated each year since. All water purchasers have been delivered their full supply of purchased water

without difficulty. The unit of water measurement, used as a basis of water sales on this project is the miner's inch.

In 1951 there were 1,849 acres irrigated with 394 acres potentially irrigable under the canal system, or a maximum irrigable acreage of 2,243 under the Livingston Ditch Project. (See map in Part II, Pages 20, 24, 25, 29).

ARTICLES OF INCORPORATION
of
LIVINGSTON DITCH WATER USERS' ASSOCIATION

KNOW ALL MEN BY THESE PRESENTS: That we, the undersigned, pursuant to and in conformity with the provisions of Chapters 1 to 12, Part III, Civil Code of Montana 1921, and Acts amendatory thereof or supplemental thereto, associate ourselves together, not for profit, and do hereby adopt the following Articles of Incorporation.

ARTICLE I

The corporate name of this corporation is hereby declared to be the "Livingston Ditch Water Users' Association."

ARTICLE II

The objects and purposes for which this corporation is formed are as follows:

1. To appropriate, purchase, market, sell, pump, divert, develop, furnish, distribute, lease and dispose of the waters of the Yellowstone River by means of diversion dam located at or near the center of the NE¼, in Section 11, Township 3 South, Range 9 East, transporting water through a ditch approximately 12 miles in length in a northeasterly direction to irrigate lands in Township 1 South, Range 10 East, and in Township 2 South, Ranges 9 and 10 East, and in Township 3 South, Range 9 East, all in Park County, Montana, and such other structures as may be necessary to carry out the purposes of the Association, and the waters from the tributaries of all of the foregoing rivers, creeks and streams and from all other available sources of supply, together with the return flow of all of the foregoing sources of supply, together with the return flow of all of the foregoing waters furnished or supplied by seeping or overflowing from the previous place of use of such waters and the waters from other dams, reservoirs, diversion canals, distributing canals, lateral ditches, pumping units, mains, pipe line and water works systems.

2. To enter into and carry out agreements with the State of Montana, the State Water Conservation Board, the United States of America, or any instrumentality or agency thereof, any person, firm, association, corporation, private, public or municipal with reference to the purchasing, marketing, furnishing, distributing and selling of the aforesaid waters, and of the privilege of obtaining such waters when available, and the diversion, development, disposition and utilization of such waters, the charging, collecting, and disposition of rents and revenues for such waters and privileges, the operation, maintenance, repair, alteration, construction, reconstruction and supervision of the means of conserving and distributing such waters.

3. To construct, reconstruct, maintain, repair, alter, use, control and operate dams, reservoirs, irrigation works and systems, drainage works and systems, diversion canals, distributing canals, lateral ditches, pumping ditches, pumping units, mains, pipe lines, water works systems and other means of conserving and distributing the aforesaid waters.

4. To lease, sell or otherwise dispose of water, water rights, lands, easements and/or property which it may acquire.

5. To acquire, own and hold such real and personal property as may be necessary or convenient for the transaction of its business.

6. To incur debtedness upon its bonds, notes, contracts or other evidences of indebtedness, and to secure the same by mortgage, deeds or trust, pledges of any or all of its revenues and contracts, or in

any other manner, subject, however, to the approval of any such indebtedness by resolution of the State Water Conservation Board.

7. To acquire, hold and dispose of stock in other corporations, domestic or foreign.

8. To acquire by purchase, forfeiture or in any other legal manner, shares of the capital stock of this corporation, and to acquire and exercise options thereon, and to dispose of, re-issue or cancel same as the Board of Directors may determine.

9. To have and exercise all the powers and to perform any and all acts necessary, convenient or appropriate to carry out any one or more of the said purposes or anything incident thereto, or which shall at any time appear conducive or expedient for the protection or benefit of the Association or its shareholders, and to that end to enter into any contract, agreement or other arrangement with the State of Montana, the State Water Conservation Board, the United States of America, or any instrumentality or agency thereof, or any person, firm, association, corporation, private, public or municipal, or any state or foreign government.

10. To make and promulgate By-Laws for the government and control of this corporation. The By-Laws, or amendments thereto, adopted by the Board of Directors shall be and become effective only after their approval by the State Water Conservation Board.

11. The powers herein granted and conferred, shall be exercised only with the approval of the State Water Conservation Board.

ARTICLE III

The principal place of transacting the business of the corporation shall be at Livingston, in the County of Park, State of Montana.

ARTICLE IV

This corporation shall continue in existence for the term of forty (40) years from and after the filing of these Articles of Incorporation.

ARTICLE V

The number of directors who shall manage the affairs of this Corporation shall be five (5), and the names and residences of those who are appointed for the first three months, and until their successors are elected and qualified are as follows:

F. M. Nelson	Livingston, Montana
E. M. Sybert	Livingston, Montana
Frank Bliss	Livingston, Montana
S. Bennett	Livingston, Montana
J. R. Kaiserman	Livingston, Montana

ARTICLE VI

The Capital Stock of said corporation shall be Five Thousand ($5,000.00) Dollars, which shall be divided into five thousand (5,000) shares of the par value of One Dollar ($1.00) each. Each shareholder of the capital stock of this corporation shall be entitled to one (1) vote for each share of stock owned by him.

Capital shares of the stock of this corporation shall be subject to purchase, sale or forfeiture under such terms and conditions as are provided by the By-Laws of the corporation and its Subscription and Pledge Agreement with shareholders. Except with the consent of the corporation, no stock of this corporation shall be transferred on the books of the corporation so long as the owner or owners thereof are obligated in any way to the corporation, whether such obligations be matured or unmatured, or be under a Subscription Agreement or note, a Water Purchase Contract, or otherwise.

The private property of the stockholders of this corporation shall not be liable for the obligation of the corporation except as in the By-Laws of the corporation otherwise provided.

ARTICLE VII

That the amount of the Capital Stock actually subscribed is Twenty-five ($25.00) Dollars, as follows:

F. M. Nelson	$5.00
E. M. Sybert	5.00
Frank Bliss	5.00
S. Bennett	5.00
J. R. Kaiserman	5.00

Witness our hands and seals this 4th day of May, A. D., 1936.

E. M. Nelson
E. M. Sybert
Frank Bliss
S. Bennett
J. R. Kaiserman

LOWER SHIELDS RIVER CANAL COMPANY

On June 4, 1904 the Lower Shields River Canal Company was incorporated for the purpose of constructing an irrigation system and appropriating water from the Shields River. After the first 20 year term of the corporation expired, the Company filed an extension to its charter for another 20 year period. This extension expired on or about May 22, 1944.

The project consisted of enlarging and extending an old ditch known as the "Ben Myers Ditch" and would convey water through parts of Sections 13 and 24, Township 1 North, Range 9 East; Sections 19, 28, 29, 30, and 33, Township 1 North, Range 10 East; and Sections 3, 4, 10, and 11, Township 1 South, Range 10 East. One appropriation was filed by the Lower Shields River Canal Company on August 13, 1904 for 3,000 miner's inches of water, the point of diversion being described as near the head of a ditch known as the "Ben Myers Ditch" on the east side of the Shields River in the southwest quarter of the southwest quarter of Section 13, Township 1 North, Range 9 East.

On August 10, 1946, the Lower Shields River Canal Company reincorporated and acquired all property, real and personal, water rights, and a certain irrigation canal heretofore owned by the Lower Shields River Canal Company, a corporation which was organized and incorporated on June 4, 1904, and whose charter expired on or about May 22, 1944. The amount of capital stock issued by the corporation was $1,600 with the stock being divided into 1,600 shares having a par value of $1.00 each.

The main construction features on the project are a concrete dam and the main canal. The dam is constructed the full width of the Shields River with a wing extending from the end of the dam containing a steel and concrete headgate. The main canal, in good condition, is ten miles long running almost due southeast throughout its entire length. One of the larger structures in the canal system is a steel flume across Tobin Creek. There are several other smaller flumes and culverts in the canal system built of wood and concrete material.

The stockholders in the Company are assessed for operation and maintenance of the canal system according to the number of shares of stock that each person owns in the Company. All of the stock issued by the Company has been subscribed to and is now divided among seven stockholders. One share of stock is equivalent to approximately 1.6 miner's inches of water. The Lower Shields River Canal Company have been decreed 2,575 miner's inches of water from the Shields River, dated July 25, 1904 and decreed March 3, 1911, Case No. 2717.

In 1951 there were 797 acres irrigated with 30 acres potentially irrigable under the canal system, or a maximum irrigable acreage of 827 under the Lower Shields River Canal Company. (See map in Part II, Pages 15, 16, 20).

ARTICLES OF INCORPORATION

of

LOWER SHIELDS RIVER CANAL COMPANY

KNOW ALL MEN BY THESE PRESENTS: That we, the undersigned, Glen A. Chadbourne, Ralph Woodring, and A. B. Bohleen, residents of the County of Park and State of Montana, have this day volun-

tarily associated ourselves together for the purpose of forming a corporation under the laws of the State of Montana, and do hereby certify as follows:

First: The name of the Corporation shall be "Lower Shields River Canal Company."

Second: The purpose for which said corporation is formed are to acquire by appropriation, purchase or conveyance, or otherwise, water rights, water ditches, and canals, and the right to the use of the water of the Shields River in the County of Park, State of Montana, in such quantity or quantities, as may be hereafter desired by said corporation, and to secure, acquire and possess any water rights, ditches or canals or right to the use of the water of the said Shields River, now owned or possessed by any other person, company, or corporation, and to acquire by purchase, deed or conveyance, or any other lawful means, any water rights, or rights to the use of waters of any other stream within the said County of Park, together with ditches or canals for conveying said waters to the lands of any of the stockholders of this corporation or to the lands of any person who becomes the purchaser from said corporation of waters hereafter acquired or owned by it for any useful or beneficial purposes.

And it is further declared to be a part of the purposes of said corporation to use the water so to be acquired as aforesaid.

(a) Upon the lands of its stockholders, to the extent required by them, and in proportion to their respective shares and interests in said company, and if there is any surplus water remaining after supplying the needs and requirements of all of said stockholders, then the surplus thereof shall be subject to sales and disposal to any person, company or corporation desiring to purchase said water or any part thereof for any useful or beneficial purposes.

(b) The said waters and the right to the use thereof are to be used for the purpose of irrigation of lands, culinary and domestic purposes, and for the purpose of sale as aforesaid and for all other useful and beneficial purposes not in conflict herewith.

And it is further declared to be the purposes of said corporation to acquire, purchase, hold, possess, own, control, maintain, use and enjoy all of the property, real, personal and mixed of every kind and description, heretofore owned by the Lower Shields River Canal Company, a corporation organized under the laws of the State of Montana, the Articles of Incorporation of which were filed in the office of the County Clerk and Recorder of Park County, Montana on the 4th day of June, 1904, the term of existence of which said corporation, after extension of its corporate existence was extended, expired on or about the 22nd day of May, 1944, including that certain irrigation canal, and extending and conducting the waters of the Shields River from a point beginning at the head of the ditch known as "Ben Myers Ditch," taken out of Shields River on the east side thereof in Section 13, Township 1 North, Range 9 East, running thence in a southeasterly direction to parts of Sections 13 and 24, Township 1 North, Range 9 East and through parts of Sections 19, 30, 29, 28 and 33, Township 1 North, Range 10 East, and Sections 3, 4, 10, and 11, Township 1 South, Range 10 East to its terminus, said ditch running almost due southeast throughout its entire length; and all easements and rights incident to the ownership of said canal and the right to maintain, repair and enlarge and extend said canal, and to conduct and flow and distribute waters in and through the same into and upon the lands and farms of the respective stockholders of this corporation and to and upon the lands and farms for the purposes of irrigation and other useful purposes and including those certain water rights acquired by the said Lower Shields River Canal Company by appropriation from the said Shields River, made on the 25th day of July, 1904 of 2,575 inches of water, or a flow equivalent to 64⅜ cubic feet per second of time of the waters of Shields River, which said water right was decreed to belong to the said Lower Shields River Canal Company by decree of the District Court of the Sixth District of the State of Montana, in and for the County of Park, dated March 3, 1911, together with all other water rights and water canals and ditches and easements and property connected therewith, which the said Lower Shields River Canal Company owned at the time its charter expired.

Third: The place where the principal business of said corporation is to be transacted, and the place where the principal office shall be located, is the City of Livingston, in the County of Park and State of Montana.

Fourth: Said corporation shall have continual existence from and after the date of its incorporation.

Fifth: There shall be three (3) directors of said corporation, and the names and residences of the persons who are appointed for the first three months and until their successors are elected and qualified are as follows:

Glen A. Chadbourne	Livingston, Montana
Ralph Woodring	Livingston, Montana
A. B. Bohleen	Livingston, Montana

Sixth: The amount of the capital stock of said corporation is $1,600.00 and the number of shares into which it is divided is 1,600 shares, of the par value of $1.00 each.

Seventh: The amount of capital stock which has been actually subscribed is $1,600.00 and the following are the names of the persons by whom the same has been subscribed and the amount subscribed by each of them, to-wit:

Myrtle Birch	300 shares	$300.00
Harvey Eyman	200 shares	200.00
Glen A. Chadbourne	450 shares	450.00
Ralph Woodring	200 shares	200.00
C. W. Abbott	100 shares	100.00
A. B. Bohleen	200 shares	200.00
Emil Kumke	150 shares	150.00

In Witness Whereof, we have hereunto set our hands and seals this 10th day of August, 1946.

Glenn A. Chadbourne
A. B. Bohleen
Ralph Woodring

PARK BRANCH CANAL

The lands irrigable under the Park Branch Canal are located along the west side of the Yellowstone River from a point approximately 3 miles south of Emigrant to a point about 25 miles south of Livingston, and comprise approximately 6,000 acres at the present time.

The first irrigation development of this land was under the old Park Branch Canal Company and the ditch was called the "Armstrong Ditch" through common usage. When first developed, the ditch was about 11 miles in length and too small to carry adequate water for the 3,500 acres then under the system. Approximately 1,000 acres were actually irrigated and the major portion of this land was vested in seven owners whose land averaged over 100 acres per farm. The project was developed in 1893 and the Park Branch Canal Company filed Articles of Incorporation on April 14th of that year for a term of 40 years. Capital stock was issued in the amount of $25,000. The Articles of Incorporation mention that the Company intended to file an appropriation on 5,000 miner's inches of water from the Yellowstone River but there are no records available to show that this filing was ever made. The Company issued 250 shares of stock with a par value of $100.00 per share and did not specify the amount of water represented by each share so, consequently, the water was proportionally divided among the stockholders. The original point of diversion was approximately 1¼ miles downstream from the present point of diversion. In 1933, the Company was re-incorporated for an additional period of 40 years.

The Park Branch Water Users' Association incorporated on December 21, 1935 for the purpose of entering into a contract with the State Water Conservation Board to enlarge, re-locate and extend the old "Armstrong" or Park Branch Canal Company ditch. The Association was capitalized for $10,000 divided into 10,000 shares with a par value of $1.00 per share. They entered into water purchase contracts (see page 49) with 26 private users who agreed to pay

$1.00 per miner's inch of water on a total of 4,702 miner's inches of water covered by the contracts. The resulting sum of $4,702.00 per annum was approved by the Water Board as being sufficient to meet all interest and retire the indebtedness of the Association. The 26 original water purchase contracts were dated November 1, 1937 and end November 1, 1965.

The Water Board acquired all of the Park Branch Canal Company's rights in the existing ditch facilities and rights appurtenant thereto through a deed from the Company dated May 5, 1936 and duly recorded in the office of the Clerk and Recorder, Park County, State of Montana, in Book 64 of Deeds on pages 554, 555 and 556. In addition to the above mentioned rights, the Board filed on 250 cubic feet per second of the unappropriated waters of the Yellowstone River, in instrument number 12203, filed on the 23rd day of October, 1935 in the above mentioned office. The Board further acquired all water and water rights and made all filings which were necessary to provide sufficient water to operate the proposed project to full capacity.

After obtaining the approval of all agencies involved, a contract was awarded to J. L. McLaughlin of Great Falls, Montana, who submitted a low bid of $97,055.64 to construct the project. Work was started on July 28, 1936 and was accepted by the Water Board as completed on June 1, 1937. The canal is approximately 20 miles long, has an initial carrying capacity of 266 cubic feet per second and tapers down to 32 cubic feet per second at the lower end. The right-of-way for the canal totals 144.6 acres. There is no storage provided for in the system, therefore, the project depends upon direct diversion. The canal diverts from a side channel on the west bank of the Yellowstone River about 3 miles above Emigrant in the northwest quarter of the southeast quarter of Section 4, Township 6 South, Range 8 East. Diversion is by means of a concrete weir across the channel and a series of headgates at the canal entrance to control the amount of water diverted. The weir provided for 88 feet of flashboard that may be raised 3 feet 9 inches high. There are four slide gates at the entrance to the canal, each 3½ feet by 5 feet. The canal project required 251,184 cubic yards of excavation, of which 3,414 cubic yards was rock formation. Several difficult canal re-locations were made and at one place it was necessary to re-locate 2,950 feet of the Northern Pacific Park Branch Railroad and build a 15 foot span railway bridge. The project also included 60 feet of 7½ foot flume.

The total cost of the project was $145,481.27, of which $55,636.00 was obtained through P.W.A. grant, $68,000.00 from sale of Water Board, Series "F" Bonds, and $21,845.27 was borrowed from the Water Board revolving funds. Series "F" Bonds were issued as of January 1, 1936 and bear interest at the rate of 4% per annum payable on January 1st of each year starting January 1, 1937. Payments to retire the Bond principal were started on January 1, 1939 and will end January 1, 1966. The funds obtained by the Park Branch Water Users' Association, through the water purchase contracts aforementioned, in the amount of $4,702.00 per annum, have been remitted to the Water Board on the 1st of November each year since 1937. The water purchase contracts were assigned to the Water Board to secure the amount of the indebtedness on the project.

This project was first operated during the season of 1937 and has been in continuous operation ever since. In 1951 there were 4,508 acres irrigated with 1,561 acres potentially irrigable under the canal system, or a maximum irrigable acreage of 6,069 under the Park Branch Canal Company. The water is sold with the miner's inch as a unit of measurement instead of the acre foot. (See map in Part II, Pages 29, 33, 34, 35).

ARTICLES OF INCORPORATION

of

PARK BRANCH WATER USERS' ASSOCIATION

KNOW ALL MEN BY THESE PRESENTS: That we, the undersigned, pursuant to and in conformity with the provisions of Chapters 1 to 12, Part III, Civil Code of Montana, 1921, and Acts amendatory thereof or supplemental thereto, associate ourselves together, not for profit, and do hereby adopt the following Articles of Incorporation:

ARTICLE I

The corporate name of this corporation is hereby declared to be "Park Branch Water Users' Association."

ARTICLE II

The objects and purposes for which this corporation is formed are as follows:

1. To appropriate, purchase, market, sell, pump, divert, develop, furnish, distribute, lease and dispose of the waters of the Yellowstone River by means of a diversion located in the SW¼SE¼ of Section 4, Township 6 South, Range 8 East, and transporting the water through a ditch approximately 16 miles in length, flowing in a northeasterly direction to irrigate lands in Township 4 South, Range 9 East and in Township 5 South, Range 8 East, and Township 5 South, Range 9 East, all in Park County, Montana, and such other structures as may be necessary to carry out the purposes of the Association, and the waters from the tributaries of all of the foregoing rivers, creeks and streams and from all other available sources of supply, together with the return flow of all of the foregoing waters furnished or supplied by seeping or overflowing from the previous place of use of such waters from other dams, reservoirs, diversion canals, distributing canals, lateral ditches, pumping units, mains, pipe lines, and water works systems.

2. To enter into and carry out agreements with the State of Montana, the State Water Conservation Board, the United States of America, or any instrumentality or agency thereof, any person, firm, association, corporation, private, public or municipal with reference to the purchasing, marketing, furnishing, distributing and selling of the aforesaid waters and of the privilege of obtaining such waters when available, and the diversion, development, disposition and utilization of such waters, the charging, collecting and disposition of rents and revenues for such waters and privileges, the operation, maintenance, repair, alteration, construction, reconstruction and supervision of the means of conserving and distributing such waters.

3. To construct, reconstruct, maintain, repair, alter, use, control and operate dams, reservoirs, irrigation works and systems, drainage works and systems, diversion canals, distributing canals, lateral ditches, pumping ditches, pumping units, mains, pipe lines, waterworks systems and other means of conserving and distributing the aforesaid waters.

4. To lease, sell or otherwise dispose of water, water rights, lands, easements, and/or property which it may acquire.

5. To acquire, own and hold such real and personal property as may be necessary or convenient for the transaction of its business.

6. To incur indebtedness upon its bonds, notes, contracts or other evidence of indebtedness, and to secure the same by mortgage, deeds of trust, pledges of any or all of its revenues and contracts, or in any other manner, subject, however, to the approval of any such indebtedness by resolution of the State Water Conservation Board.

7. To acquire, hold and dispose of stock in other corporations, domestic or foreign.

8. To acquire by purchase, forfeiture or in any other legal manner, shares of the capital stock of this corporation, and to acquire and exercise options thereon, and to dispose of, re-issue or cancel same as the Board of Directors may determine.

9. To have and exercise all the powers and to perform any and all acts necessary, convenient or appropriate to carry out any one or more of the said purposes or anything incident thereto, or which shall at any time appear conducive or expedient for the protection or benefit of the Association or its shareholders, and to that end to enter into any contract, agreement or other arrangement with the State of Montana,

the State Water Conservation Board, the United States of America, or any instrumentality or agency thereof, or any person, firm, association, corporation, private, public or municipal, or any state or foreign government.

10. To make and promulgate By-Laws for the government and control of this corporation. The By-Laws, or amendments thereto, adopted by the Board of Directors shall be and become effective only after their approval by the State Water Conservation Board.

11. The powers herein granted and conferred, shall be exercised only with the approval of the State Water Conservation Board.

ARTICLE III

The principal place of transacting the business of the corporation shall be at Livingston, in the County of Park, State of Montana.

ARTICLE IV

This corporation shall continue in existence for the term of 40 years from and after the filing of these Articles of Incorporation.

ARTICLE V

The number of directors who shall manage the affairs of this corporation shall be five (5) and the names and residences of those who are appointed for the first three months, and until their successors are elected and qualified are as follows:

Paul L. Armstrong	Livingston, Montana
John P. Darroch	Livingston, Montana
Frank Gates	Livingston, Montana
John Putzker	Pray, Montana
Claude D. Armstrong	Livingston, Montana

ARTICLE VI

The capital stock of said corporation shall be Ten Thousand Dollars ($10,000), which shall be divided into ten thousand shares of the par value of One Dollar ($1.00) each. Each shareholder of the capital stock of this corporation shall be entitled to one vote for each share of stock owned by him.

Capital shares of the stock of this corporation shall be subject to purchase, sale or forfeiture under such terms and conditions as are provided by the By-Laws of the corporation and its subscription and pledge agreements with shareholders. Except with the consent of the corporation, no stock of this corporation shall be transferred on the books of the corporation so long as the owner or owners thereof are obliged in any way to the corporation, whether such obligations be matured or unmatured or be under a subscription agreement, or note, a Water Purchase Contract, or otherwise.

The private property of the stockholders of this corporation shall not be liable for the obligation of the corporation except as in the By-Laws of the corporation otherwise provided.

ARTICLE VII

That the amount of Capital Stock actually subscribed is as follows:

Paul S. Armstrong	$5.00
John P. Darroch	5.00
Frank Gates	5.00
John Putzker	5.00
Claude Armstrong	5.00

Witness our hands and seals this 21st day of December, 1935.

Paul S. Armstrong
John P. Darroch
Frank Gates
John Putzker
Claude D. Armstrong

SHIELDS CANAL COMPANY

The lands now occupied by the Shields Canal Company were first irrigated by the Clyde Park Canal Company. On August 27, 1903 the Clyde Park Canal Company was incorporated

for the purpose of constructing an irrigation system and appropriating water from the Shields River. The corporation expired on or about August 27, 1923.

On October 6, 1927, A. S. Christie, Frank Beller, and Henry Stauber associated themselves together for the purpose of reincorporating the Clyde Park Canal Company. The amount of capital stock was $15,000 divided into 1,500 shares having a par value of $10.00 each. Under the terms of the Articles of Incorporation it was declared that this corporation would acquire, purchase, hold, own, control, maintain, use and enjoy all the property, real, personal and mixed of every kind and description heretofore owned by the Clyde Park Canal Company.

The system is described as a canal 10 miles long, sufficient in size to carry and conduct 1,600 inches of water diverting from a point on the west bank of the Shields River near the section line dividing Sections 29 and 30 in Township 3 North, Range 9 East. From this point the canal runs in a southerly direction through Sections 29, 30 and 32 in Township 3 North, Range 9 East and Sections 5, 8, 17 and 21 in Township 2 North, Range 9 East.

The water right of 1,480 miner's inches appropriated September 3, 1903, which was acquired by the Clyde Park Canal Company, was decreed in the case of Geo. W. Henwood et al, vs. Wilbur H. Hodson, et al, in the District Court of Park County, Montana, dated March 3, 1911.

In the spring of 1948 high water washed out the diversion dam and part of the upper section of the Clyde Park Canal. The water users under the Clyde Park Canal Company found it would be necessary to change the location of the intake to make it less accessible to flood damage. Also, an old flume near the lower end of the canal was in poor repair and would have to be replaced before the canal system could be operated again.

In the immediate vicinity was an old ditch that had been built and never used. Local gossip was that the engineers graded this ditch in the wrong direction. By rehabilitating this old ditch system some additional irrigable land could be irrigated and still include all the acreage now irrigated by the Clyde Park Canal.

Finally, an agreement was reached to abandon the Clyde Park Canal and to change the point of diversion from the Shields River to Flathead Creek. It was also agreed upon by the water users under the two canals to consolidate their efforts in rehabilitating the old ditch. Thereupon, the farmers made application to the Farmers Home Administration for funds to finance the project. Some delay was necessary before the approval of the loan could be completed. Meanwhile, the farmers were anxious to get the construction work started so that the project lands would have water delivered in the spring of 1949 and thus save the loss of any crops. In the fall of 1948, the farmers requested the State Water Conservation Board to construct the project for them. This request was granted by the Board and on September 3, 1948 the Shields Canal Users' Association was formed. Accordingly, an agreement was entered into by the Shields Canal Users' Association and the State Water Conservation Board, Dated October 25, 1948. The agreement provided as follows: That the Board shall prepare all the necessary plans and specifications and supervise the construction work; that the Shields Canal Users' Association is negotiating a loan and it is necessary that the title to the rights-of-way, water rights, and canal be vested in the Association; and, in the event a loan is obtained, the Board will assign these assets to the Association, and the Association then will reimburse the Board for all expenditures. That if the loan is not obtained, the Association will secure the sale of Water Conservation Board Revenue Bonds to satisfy the claims; that if the loan is not granted the Association agrees to enter into a canal marketing contract with the Board.

The Board proceeded immediately with the construction work and completed in the fall of 1948 the following: a diversion dam and concrete syphon across Flathead Creek, and a concrete syphon under the highway and railroad tracks.

The dam is described as a concrete structure having a crest of 3 feet higher than the creek bed and is 40 feet long. It is provided with flashboards so that the water can be raised 1½ feet higher than the spillway crest. The 48 inch pre-cast concrete syphon under Flathead Creek is 48 feet long and contains a concrete headgate with a 4 foot by 4 foot slide gate placed at the head of the syphon. The syphon under the railroad tracks and the highway is also 48 inch pre-cast concrete and is 175 feet long.

The water rights deeded to the State Water Conservation Board and used by the Shields Canal Users' Association are: From Tony & Nancy Lennemann, 250 miner's inches of water appropriated and decreed by H. J. Staubach and Geo. Brown on May 2, 1902; 150 miner's inches of water appropriated and decreed by H. J. Staubach and Geo. Brown on April 1, 1891, by a decree of the District Court dated March 3, 1911, Case No. 2717. The deeds are filed in Volume 78, Page 91 of Deeds in Park County, Montana. Also the following water rights from Clyde A. Kirby and Thelma Kirby: 60 miner's inches of water appropriated and decreed to Thomas Toston on May 15, 1888; 60 miner's inches of the 80 inch right appropriated and decreed to Thomas Toston on April 1, 1887; 25 miner's inches of the 50 inch right appropriated and decreed to Thomas Toston on May 1, 1894; and 100 miner's inches of the 200 inch right appropriated and decreed to Thomas Toston January 1, 1910, by a decree of the District Court dated March 3, 1911, Case No. 2717. The deeds are filed in Volume 79, Page 62 of Deeds in Park County, Montana.

By the time the Water Board finished construction of the diversion dam and two syphons, the Shields Canal Users' Association had received approval of the loan from the Farmers Home Administration and wanted to complete the canal work with its own forces. The Water Board was reimbursed for their expenditures in the project and had nothing further to do with the construction work. A resolution adopted provided for the following:

WHEREAS, the State Water Conservation Board had proposed the construction and operation of an irrigation project in Park County, Montana, to be known as the Shields Canal Project, and in connection therewith and in pursuance of the authority provided under the provisions of Section 349.18 of the Revised Codes of Montana, 1935, filed in the office of the Clerk and Recorder of Park County, Montana, a declaration of intention to store, control and/or divert fifty (50) cubic feet per second of time of the unappropriated waters of Flathead Creek in said county; which declaration was duly filed December 17, 1948 and recorded in Volume 25 of the Miscellaneous Records of said County at Page 563 thereof; and

WHEREAS, after construction of said project was commenced by the State Water Conservation Board and before its completion, the land owners within said project, upon a contract with State Water Conservation Board to that effect, assumed the responsibility to complete said construction of said project and thereafter to operate the same, and for that purpose organized a Montana corporation known as the Shields Canal Company; and

WHEREAS, it is the desire of said land owners and said corporation that the State Water Conservation Board assign said above-mentioned declaration and all rights there-under to said corporation for the term of the useful life of said project;

NOW, THEREFORE, it is hereby resolved by the State Water Conservation Board that the said declaration of intention to store, control and/or divert fifty (50) cubic feet per second of

time of the unappropriated waters of Flathead Creek in Park County, Montana, together with all rights and obligations acquired by the State Water Conservation Board thereunder, and which declaration is recorded in Volume 25 of the Miscellaneous Records of said county, at Page 563 thereof, do be assigned to the Shields Canal Company, a Montana corporation, for a term of the useful life of said project.

The Farmers Home Administration made two advances of funds for the Shields Canal Project totalling approximately $73,000. About $35,000 of this amount was used for re-financing funds advanced by the State Water Board. The balance of the loan was used for completion of the project. The first advance was made in 1949 and the second advance was in 1950. The engineering staff of the Farmers Home Administration supplied the technical assistance and supervision required to finish the construction work of the canal. This work consisted of constructing 7.2 miles of canal with the necessary turn-outs, culverts, and checks. The Shields Canal was completed and water delivered as contemplated in the spring of 1949.

Plans and engineering data have been completed by the State Water Conservation Board for a storage dam and reservoir just west of the present highway on Little Cottonwood Creek about 4 miles north of Wilsall. When this reservoir is built an ample supply of water can be furnished to the project, as the present water supply from Flathead Creek is inadequate in dry years.

Articles of Incorporation for the Shields Canal Company were filed on April 8, 1949. The Company incorporated as a non-profit organization and no capital stock was issued. The object and purposes for which the corporation was formed are to appropriate, purchase, market, sell, pump, divert, develop, furnish, distribute, lease and dispose of the water of Flathead Creek by means of a ditch known as the Shields Canal. The point of diversion is described at a point on the east bank of Flathead Creek in the southwest quarter of Section 18, Township 3 North, Range 9 East.

In 1951 there were 919 acres irrigated with 521 acres potentially irrigable under the canal system, or a maximum irrigable acreage of 1,440 under the Shields Canal Company. (See map in Part II, Pages 8, 11).

ARTICLES OF INCORPORATION

of

SHIELDS CANAL COMPANY

KNOW ALL MEN BY THESE PRESENTS: That we, the undersigned have associated ourselves together for the purpose of becoming a body corporate, not for pecuniary profit, under and by the laws of the State of Montana, and in accordance therewith execute and acknowledge this certificate as follows:

ARTICLE I

The name of said Corporation shall be "Shields Canal Company."

ARTICLE II

The purposes and objects for which this Corporation is formed are as follows:

1. To appropriate, purchase, market, sell, pump, divert, develop, furnish, distribute, lease and dispose of the waters of Flathead Creek in Park County, Montana, by means of a ditch or canal to be known as the Shields Canal, the point of diversion of the waters of said Flathead Creek being at a point on the east bank of said Flathead Creek in the SW¼ of Section 18, Township 3 North, Range 9 East, Park County, Montana, about one-fourth of a mile southerly and below the point where Potters Creek flows into said Flathead Creek. From said point of diversion said canal or ditch will run in a southerly direction for a distance of about eight miles in a meander course, generally through the central portions of Sections 18,

19, 30 and 31, all being in Township 3 North, Range 9 East, Park County, Montana; and Sections 6, 7, and 18 in Township 2 North, Range 9 East, Park County, Montana.

And further to divert waters by means of said ditch or canal from other available sources of supply, together with the return flow of all of the foregoing waters, furnished or supplied by seeping or overflowing from the previous place of use of such waters, and of other dams, reservoirs, diversion canals, distributing canals, laterals, ditches, pumping units, mains, pipe lines and water works systems; said waters to be used for irrigating lands adjacent to and below said ditch, and for other useful and beneficial purposes.

2. To enter into and carry out agreements with the State of Montana, the United States of America, or any instrumentality or agency thereof, any person, firm, association, corporation, private, public or municipal with reference to the purchasing, marketing, furnishing, distributing, and selling of the aforesaid waters, and of the privilege of obtaining such waters when available, and the diversion, development, disposition and utilization of such waters, the charging, collecting, and disposition of rents and revenues for such waters and privileges, the operation, maintenance, repair, alteration, construction, reconstruction, and supervision of the means of conserving and distributing such waters.

3. To construct, reconstruct, maintain, repair, alter, use, control and operate dams, reservoirs, irrigation works and systems, drainage works and systems, diversion canals, distributing canals, lateral ditches, pumping ditches, pumping units, mains, pipe lines, waterworks systems, and other means of conserving and distributing the aforesaid waters.

4. To lease, sell or otherwise dispose of water, water rights, lands, easements and property which it may acquire.

5. To acquire, own and hold such real and personal property as may be necessary or convenient for the transaction of its business.

6. To incur indebtedness upon its bonds, notes, contracts or other evidence of indebtedness, and to secure the same by mortgages, deeds of trust, pledges of any or all of its revenues and contracts, or in any other manner.

7. To have and exercise all the powers and to perform any and all acts necessary, convenient or appropriate to carry out any one or more of the said purposes or anything incident thereto, or which shall at any time appear conducive or expedient for the protection or benefit of the corporation or its members, and to that end to enter into any contract, agreement or other arrangement with the State of Montana, the United States of America, or any instrumentality or agency thereof, or any person, firm, association, corporation, private, public, or municipal, or any state or foreign government.

ARTICLE III

This Corporation shall have perpetual existence from and after the filing of this Article of Incorporation.

ARTICLE IV

The principal place of business of this Corporation shall be at Wilsall, County of Park, State of Montana, and the principal business of the Corporation shall be carried on in said County and State.

ARTICLE V

This Corporation shall be governed by a Board of Directors consisting of three in number, and Webb M. Brogan, residing at Wilsall, Montana; T. F. Lennemann, residing at Wilsall, Montana; and Carl Arthun, residing at Wilsall, Montana; shall constitute the first Board of Directors to manage the affairs of the Corporation for the first three months and until their successors are nominated and qualified. At the first election of the directors to succeed the above named directors, one director shall be elected to serve for a period of one year, one director shall be elected to serve for a period of two years, and one director shall be elected to serve for a period of three years, or until their successors are duly elected and qualified. Thereafter, one director shall be elected each year to serve for a period of three years, or until his successor shall be duly elected and qualified. Such directors shall be elected from the membership of the corporation and shall cease to be directors after and when their membership in this Corporation is terminated for any reason whatsoever.

ARTICLE VI

This is a non-profit Corporation and it shall not issue any capital stock. No profit shall accrue to the benefit of, or dividends be paid to, any members out of the operations of the irrigation system or other facilities owned by the Corporation except upon dissolution, and all surplus shall be used for the sole purpose of improving, maintaining or operating said Corporation, its ditches, canals, reservoirs or other facilities.

ARTICLE VII

The membership of this Corporation shall be limited to those owning lands along and under the Shields Canal, or any enlargement or extension thereof. The Board of Directors will issue or cause to be issued to each member upon admission to membership in said Corporation, a Certificate of Membership in such form as the Board prescribe. Each member shall have but one vote regardless of the interest held in the Corporation.

ARTICLE VIII

The Corporation shall have the right and power to adopt such prudential by-laws not inconsistent with these Articles of Incorporation and the laws of the State of Montana as may be deemed proper for the management of the affairs of the Corporation, and to carry into effect the purposes of the Corporation, and to alter, amend and repeal said by-laws.

In Witness Whereof, we have hereunto set our hands this 8th day of April, 1949.

Webb M. Brogan
Carl Arthun
T. F. Lennemann
Ed Carrell
Marshall Coombs
Clyde A. Kirby
Pete Hetland
James M. Pepper
Ross Williams

SHIELDS RIVER RANCH COMPANY DITCH

The Shields River Ranch Company exclusively owns and operates approximately 12,800 acres of land which is located just north of the town of Wilsall in Park County, Montana. Development of a project to irrigate this land was started about 1910. The project presently consists of a main canal, several large laterals and a network of small laterals and diversions.

The main canal diverts water by gravity from the west bank of the Shields River near the center of Section 4, Township 4 North, Range 9 East. The water is carried to a point on the east bank of Cole Creek in the southwest quarter of the northwest quarter of Section 9, Township 4 North, Range 9 East, where it is spilled into the creek. It is then diverted from the west bank together with some additional water from Cole Creek. A short distance below this diversion some of the water is spilled into the Myers Ditch, one of the major laterals of the system. The main canal traverses in a southwesterly direction for approximately 12 miles from its point of diversion and is roughly paralleled by the Myers Ditch which extends slightly further to the south.

The other large ditch in the system is the Horse Camp Ditch which diverts water by gravity from the east bank of the Shields River in the northwest quarter of the southeast quarter of Section 26, Township 5 North, Range 9 East, and provides water for the major portion of the Company's holdings that lie east of the Shields River. A short diversion from Porcupine Creek in the southeast quarter of the northeast quarter of Section 11, Township 4 North, Range 9 East provides water for land in that section. In addition to these main diversions, several small diversions from the Shields River and a network of laterals complete the system.

The total water rights acquired by, or decreed to, the Ranch Company in the Shields River and tributaries decree, Case No. 2717, amount to 8,874 miner's inches and are appropriated from the various drainages as follows: Antelope Creek, supplemental decree, 500 inches; Cole Creek, 280 inches; Flathead Creek, 80 inches; Horse Creek, 140 inches; Porcupine Creek, 106 inches; Shields River, 6,070 inches; and Shields River, supplemental decree, 1,698 inches. Water from Antelope Creek, Flathead Creek and Horse Creek is not used at the present time.

The Company sometimes purchases water from other ditches in the area when it is considered necessary and the water is available.

In 1951 there were 1,891 acres irrigated with 86 acres potentially irrigable under the main canal system, or a maximum irrigable acreage of 1,977 under the Shields River Ranch Company Ditch. (See map in Part II, Pages 4, 5, 7, 8).

UPPER COTTONWOOD DITCH COMPANY (MUTUAL)

The Upper Cottonwood Ditch, locally referred to as the Big Company Ditch because of its being the largest or main ditch in the immediate vicinity, diverts water by gravity from the west side of Cottonwood Creek in the northeast quarter of Section 13, Township 3 North, Range 10 East. From the point of diversion, the main canal meanders in a southwesterly direction approximately nine miles to a point near the west line of Section 6, Township 2 North, Range 10 East.

The Ditch Company is not incorporated but is a mutual system of twelve present day water users. However, a written agreement was drawn up among the water users which provides use for the amount of water decreed to the ditch; the necessary assessments for repair and maintenance; the election and duties of officers; and stipulations as to the use of the water, etc. One of the stipulations under the written agreement states: "6th—It is further mutually understood and agreed by and between the owners of said ditch that whenever work shall be done above the first point of diversion on said ditch, same shall be paid for by all of the owners in said ditch in proportion to the number of inches that they own in said ditch, and in case that it shall become necessary for work to be done below any point of diversion of said ditch, the assessment that is made for the doing of said work shall only be assessed against those who derive a benefit therefrom."

Immediately below the present headworks of the Upper Cottonwood Ditch there is a gravel bar where a portion of the water in the stream flows underground. Recently, the present diversion site had to be re-located above the gravel formation in order that enough water could be diverted to meet the needs of the water users under the ditch. In recent years the average assessment for repairs and maintenance of the canal has been approximately 15c per miner's inch.

Under the decree of the Shields River and tributaries, dated March 3, 1911, 2,415 miner's inches of water was decreed to this ditch under the priority date of October 8, 1889 (Case No. 2717).

In 1951 there were 2,126 acres irrigated with 534 acres potentially irrigable under the canal system, or a maximum irrigable acreage of 2,660 under the Upper Cottonwood Ditch. (See map in Part II, Pages 9, 11, 12).

YELLOWSTONE RIVER DITCH (MUTUAL)

No official or common useage name has been applied to the ditch herein called the Yellowstone River Ditch. The ditch was built as a mutual project by Otto Anderson, Thos. S. Thompson, A. H. Dellone, F. G. Heldige and S. Y. Ford in 1892. A water right filing was made on April 4, 1892 by the above named men for 1,100 miner's inches of the waters of the Yellowstone River.

The ditch diverts on the south bank of the river near the center of Section 33, Township 1 South, Range 10 East and about 25 yards above the diversion of a ditch known as the Milligan Ditch. The original diversion was made about 150 yards above the Milligan Ditch diversion but has been changed to its present location on account of erosion of the river bank. From the point of diversion the ditch runs in an easterly direction across Sections 33, 34, 35, 26 and 25, Township 1 South, Range 10 East, and across Section 30, Township 1 South, Range 11 East, a total distance of about 4½ miles.

On March 1, 1906 an additional appropriation of 200 miner's inches was made for the ditch by the predecessors of Oscar Hogstad, and again in 1914 an additional appropriation of 50 miner's inches was made by Swan Larson, predecessor of Malvina Larson. These additional appropriations were made use of by enlarging the main ditch.

During the years 1918 and 1919, the rights in the ditch were adjudicated as may be found in Case No. 4047, Park County records, entitled Larson vs. Manzer, Dellone, Anderson, Brawner and Brawner.

In 1939 or 1940 an injunction against using the ditch was obtained by Oscar Hogstad because it had become filled with obstructions which caused it to overflow and flood his land. The injunction was evoked until such time as the ditch was properly cleaned and cared for so that it would not be harmful to lands under it. Due to labor and material shortages, and other reasons, the ditch was not put in use again until the summer of 1951 when two of the holders of decreed water rights in the ditch, Malvina Larson and the Duke & McDougal Ranch, rebuilt the headgate and cleaned about two miles of the ditch at a cost of $1,200. The proposal was that anyone who owned rights in the ditch and wanted to use it were to pay a share in the repair proportionate to the number of miner's inches of water for which they owned rights in the ditch. At the time of this survey in Park County, Mr. Hogstad, with an interest of 250 miner's inches, did not intend to use or help keep up the ditch, but Mr. A. E. Walborn, with an interest of 700 miner's inches, intended to pay his share of the repair and upkeep in order to irrigate his land under the ditch.

The total irrigated and potential acreages under the Yellowstone River Ditch is 671 acres irrigated and 285 acres potential. The figure for the irrigated acreage includes the irrigable land of Walborns', which although it was not irrigated in 1951, will be irrigated as soon as Mr. Walborn can get his part of the ditch cleaned. The figures do not include any of Hogstad's land which is under the Milligan ditch. (See map in Part II, Pages 20, 21).

WATER MARKETING CONTRACT

This is an agreement between the Association and the State Water Conservation Board, whereby the Board agrees to sell to the Association all of the available water of the project, and the Association agrees to distribute same to water purchasers; and provides method of payment of sums due, levying of assessment for operation and maintenance cost, time of noti-

fication of such levy to be given water purchasers, time of default and remedies in the event of default.

WATER PURCHASE CONTRACT

This is a contract entered into between the individual water purchasers, the Association and the State Water Conservation Board, whereby, the individual agrees to purchase a definite amount of water, and to pay therefore a definite sum of money on or before a definite day of each year, until a definite future date; in addition to such definite annual sum the individual agrees to pay such additional sum or sums as may be required annually as his proportionate share of the cost of operation and maintenance of the Association. This contract is void unless the water purchaser executes a Subscription and Pledge Agreement.

WATER RIGHT DATA—PARK COUNTY

Appropriations and Decrees by Streams

Stream	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per. Sec.
YELLOWSTONE RIVER BASIN							
***Yellowstone River Main Stem**	78	1,763,768	44,094.2	4047	7	1,500	37.5
Lamar River	0	0	0				
Slough Creek	1	200	5				
Unnamed Spring	1	500	12.5				
Bull Creek	1	500	12.5				
Cutoff Creek	1	300	7.5				
Soda Butte Creek	10	4,040	101	9235	2	63½	1.5
Unnamed Spring	3	174	4.3				
Unnamed Creek	1	150	3.8				
Sylvan Springs	2	All					
Hayden Creek	1	1,000	25				
Woody Creek	2	16,000	400				
Macumber Spring	3	200	5				
Miller Creek	18	11,725	293.1				
Crystal Spring	1	All					
Republic Creek	5	7,568	189.2				
Sheep Creek	3	2,000	50				
Crevice Creek	10	3,020	75.5				
North Fork Crevice Creek	1	500	12.5				
Crevice Spring	1	20	.5				
West Fork Crevice Creek	2	600	15				
East Fork Crevice Creek	2	600	15				
Middle Fork Crevice Creek	5	1,300	32.5				
Crevice Gulch	3	2,160	54				
Bear Creek or Bear Gulch	26	78,980	1,974.5	4975	2	1,045	26.1
Unnamed Spring	2	5	.1				
North Fork Bear Creek	8	8,630	215.8				
Willow Springs	2	45	1.1				
Willow Springs Creek	1	25	.6				
Five Lakes Creek	3	700	17.5				
Evergreen Springs	1	20	.5				
Pine Creek	10	5,982	149.7				
Pole Creek	3	445	11.1				
Webb Springs	1	80	2				
Palmer Creek	17	2,782	69.6				
Gem Spring	1	40	1				
Malin Creek	2	50	1.3				
Eagle Creek	5	135	3.4	4558	6	570	14.3
Unnamed Spring	1	40	1				
Gardiner River	3	1,800	45				
Waste Water	1	40	1				
Phelps Creek	1	All					
Quarry Creek	1	50	1.3				
Shaft House Spring	1	12	.3				
Spring Creek	1	100	2.5				
Slaughter Canyon Creek	1	40	1				
Park Lake Creek	1	150	3.8				

*Name of streams indented on the lefthand margin indicate that they are tributaries of the first stream named above which is not indented.

WATER RIGHT DATA—PARK COUNTY

Appropriations and Decrees by Streams

Stream	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per. Sec.
Stevens Creek	2	500	12.5				
Wilson Spring	1	All					
Turkey Pen Creek	1	All					
Reese Creek	9	5,475	136.9	2176 & 5356	9	590	14.8
Van Dyke Lake Spring	1	25	.6				
Electric Creek	1	100	2.5				
Sawmill Creek	3	675	16.9	2176 & 5356	1	50	1.3
Little Trail Creek	0	0	0	7556	4	150	3.8
Hot Springs	1	6	.2				
Beattie Gulch	4	250	6.3				
Unnamed Spring	1	30	.8				
Unnamed Creek	1	160	4				
Bassett Creek	5	1,114	27.9				
Dow Creek	1	500	12.5				
Warm Springs	2	140	3.5				
Hoffman Creek	1	40	1				
Mulherin Creek	9	3,460	86.5				
Deaf Jim Creek	3	480	12	8174	1	50	1.3
Foster Mine Spring	1	20	.5				
Hoppe Creek	4	730	18.3	8174	2	110	2.8
Spring Creek	1	4	.1				
Clear Water Springs	1	30	.8				
Southeast Fork Mulherin Creek	1	200	5				
Left Fork Mulherin Creek	3	278	7				
Aldridge Spring	3	175	4.4				
Unnamed Spring	3	75	1.9				
Mill Creek	3	360	9				
Quaker Ash Hollow Creek	1	40	1				
South Creek	1	320	8				
Middle Creek	0	0	0				
V Creek	0	0	0				
Lyon Hollow Creek	2	320	8	7483	5	285	7.1
North Fork Lyon Hollow Creek	0	0	0				
North Fork Dixon Creek	4	380	9.5	4774	2	180	4.5
South Fork Dixon Creek	1	300	7.5				
Cottonwood Creek	0	0	0				
Cedar Creek	11	2,265	56.6	4627	9	930	23.3
Hedborn Creek	2	300	7.5				
Unnamed Spring	1	50	1.3				
Second Creek	1	25	.6				
First Creek	0	0	0				
Spring Creek	0	0	0				
Cutler Lake	3	260	6.5				
Little Slip & Slide Creek	0	0	0				
Slip and Slide Creek	1	450	11.3				
Lake Creek	1	60	1.5				
Spring Creek	1	40	1				
Joe Brown Creek	0	0	0				
Unnamed Spring	3	180	4.5				
Unnamed Creek	1	5	.1				

WATER RIGHT DATA—PARK COUNTY

Appropriations and Decrees by Streams

Stream	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per. Sec.
Tom Miner Creek	13	3,130	78.3	7515	17	769	19.2
South Fork Tom Miner Creek	0	0	0	7515	1	25	.6
Trail Creek	0	0	0	7515	2	120	3
Dry Creek	0	0	0				
Sunlight Creek	0	0	0	7515	2	70	1.8
Walsh Creek	0	0	0	7515	1	30	.8
Sheep Creek	0	0	0				
Scully Creek	4	1,260	31.5	7515	3	666	16.7
Pine Creek	6	1,020	25.5	7515	3	420	10.5
Spring Creek	1	40	1				
Middle Creek	0	0	0				
Haskins Creek	3	880	22				
Sharpe or Tie Creek	2	210	5.3	7515	1	30	.8
Unnamed Spring	2	160	4				
Gulch Creek	1	250	6.3	7515	1	100	2.5
Unnamed Spring	1	50	1.3				
Horse Creek	11	2,150	53.8	7515	14	1,100	27.5
East Fork Horse Creek	1	160	4	7515	1	75	1.9
Middle Creek	0	0	0	7515	1	45	1.1
Blue Creek	6	520	13	7515	1	80	2
Reeder Creek	1	80	2	7515	1	50	1.3
Lee Creek	1	75	1.9	7515	2	65	1.6
Unnamed Spring	1	120	3				
Rowe Creek	1	150	3.8				
Merrell Lake	0	0	0	7515	1	40	1
Canyon Creek	5	1,070	26.8	7515	2	75	1.9
Rock Creek	5	4,310	107.8				
North Fork Rock Creek	3	500	12.5				
Tepee Creek	2	1,050	26.3				
Donahoo Creek	10	1,080	26	4004	2	150	3.8
North Fork Donahoo Creek	0	0	0				
Canon Creek	0	0	0	4004	1	150	3.8
Unnamed Lake	2	2,400	60				
West Creek	1	200	5	4003	1	20	.5
Unnamed Spring	0	0	0	4003	1	10	.3
Big Creek	29	7,190	179.8	3028	23	2,545	63.6
Unnamed Spring	2	4	.1				
Lewis Creek	0	0	0				
Mill Creek	2	1,100	27.5				
Hyalite Creek	1	200	5				
Spring Creek	1	160	4				
Dry Creek	7	800	20				
Gallinger Creek	1	80	2				
Sheep or Goldmeyer Creek	4	300	7.5				
Spring Creek	1	100	2.5				
Dailey Creek	0	0	0	2816	1	40	1
Garden Creek	2	320	8	2816	4	630	15.8
Sheep Creek	2	320	8	2816	1	100	2.5
Unnamed Spring	1	25	.6				
Dailey Lake	1	200	5				

WATER RIGHT DATA—PARK COUNTY

Appropriations and Decrees by Streams

Stream	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per. Sec.
Bottler Springs	3	250	6.3				
Six Mile Creek	22	35,350	881.3	2112	8	1,590	39.8
Unnamed Spring	1	160	4				
Gold Prize Creek	2	360	9				
Last Chance Creek	0	0	0	1968	2	All	
Gold Run Creek	3	1,475	36.9				
Gold Creek	2	600	15				
Emigrant Creek	42	40,380	1,009.5				
West Fork Emigrant Creek	1	1,000	25				
South Fork Emigrant Creek	1	500	12.5				
North Fork Emigrant Creek	2	400	10				
East Fork Emigrant Creek	9	3,050	76.3				
Madam Gailliard Creek	1	300	7.5				
Fridley Creek	1	500	12.5				
Balm of Gilead Creek	0	0	0				
Joseph Robbins Slide	1	250	6.3				
Tiger Eye Drain	1	100	2.5				
Strickland Creek	14	4,170	104.3	2570	11	1,150	28.8
Unnamed Spring	0	0	0	2570	1	All	
South Fork Strickland Creek	0	0	0	2570	1	100	2.5
Miller Creek	0	0	0				
Big Spring	1	80	2				
North Fork Strickland Creek	0	0	0	2570	1	75	1.9
Unnamed Lake	1	All					
Unnamed Spring	1	80	2				
Unnamed Creek	1	65	1.6				
Hot Springs Creek	1	50	1.3				
Spring Creek	2	275	6.9				
Slough	1	275	6.9				
Pole Gulch	1	160	4				
Tie Gulch	0	0	0				
Eight Mile Creek	28	10,200	255	3784	10	1,680	42
Unnamed Spring	2	70	1.8				
Mill Creek	20	39,955	998.9	7583	69	4,611	115.3
Middle Fork Mill Creek	1	160	4				
West Fork Mill Creek	3	2,900	72.5	7583	3	280	7
Arastra Creek	2	400	10				
Burnt Creek	0	0	0				
Bulldozer Creek	0	0	0				
East Fork Mill Creek	1	6,000	150	7583	3	830	20.8
Upper Sage Creek	0	0	0	7583	3	105	2.6
Lower Sage Creek	1	120	3				
Counts Creek	0	0	0	7583	2	30	.8
Unnamed Spring	2	42	1.1				
Davis Creek	13	5,105	127.6	375	3	300	7.5
Dry Gulch	1	40	1				
Unnamed Spring	2	50	1.3				
Elbow Creek	14	3,720	93	3075	22	2,110	52.8
North Fork Elbow Creek	0	0	0				
McGee or Spring Creek	1	160	4				
Strawberry Creek	11	2,210	55.3	4749	11	1,330	33.3

WATER RIGHT DATA—PARK COUNTY

Appropriations and Decrees by Streams

Stream	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per. Sec.
McDonald Creek	1	100	2.5				
South Fork McDonald Creek	0	0	0				
Shorthill Creek	2	320	8				
North Fork McDonald Creek	0	0	0				
Cascade Creek	2	880	22				
Joe George Creek	1	½ the waters					
Barney Creek	0	0	0				
Pine Creek	10	12,755	318.9	3171	20	3,327	83.2
Unnamed Spring	1	4	.1				
Poole Creek	0	0	0	4778	3	135	3.4
Unnamed Spring	1	All					
Deep Creek	5	760	19	3191	4	370	9
North Fork Deep Creek	0	0	0	3191	18	1,910	47.8
South Fork Deep Creek	0	0	0	3191	6	869	21.7
Unnamed Springs	1	50	1.3				
Unnamed Springs	0	0	0	3191	2	200	5
Spring Creek	6	14,640	366	7779	7	605	15.1
Suce Creek	6	1,290	32.3	6130	6	778	19.5
Mill Fork Creek	0	0	0				
Trail Creek	35	14,095	352.4	336 & 7198	16	1,634½	40.9
Unnamed Spring	1	All					
Sheep Creek	1	100	2.5				
South Fork Trail Creek	0	0	0				
Unnamed Spring	6	685	17.1				
Waste Water	1	25	.6				
Spring Creek	1	15	.4				
Pine Creek	4	580	14.5				
Kahle Creek	1	100	2.5				
Unnamed Spring	1	All					
Dry Creek	1	160	4				
Loughridge Creek	1	320	8				
Unnamed Spring	2	12	.3				
Pass Creek	1	160	4				
Strickland Creek	2	25	.6	2641	1	300	7.5
South Fork Strickland Creek	0	0	0				
Unnamed Spring	2	170	4.3				
Unnamed Spring	1	160	4				
Bullis Creek	1	All					
Hillside Springs	1	10	.3				
Cline or Dry Creek	4	400	10				
Unnamed Spring	1	20	.5				
Reservoir	1	All					
Unnamed Lake	1	80	2				
Vance Lake	1	100	2.5				
Coyote Creek	1	100	2.5				
Lost Creek	2	660	16.5				
Cline Lake	1	160	4				
Billman Creek	15	3,340	83.5	2284	11	518.9	13
Unnamed Spring	8	460	11.5				
Quinn Creek	6	760	19				

WATER RIGHT DATA—PARK COUNTY

Appropriations and Decrees by Streams

Stream	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per. Sec.
(Billman Creek) Continued							
Waste Water	1	50	1.3				
Unnamed Spring	1	75	1.9				
Hopper Creek	2	305	7.6				
Willow Springs	1	10	.3				
Spring Creek	3	200	5				
Area or O'Rear Creek	9	770	19.3	2284	9	284	7.1
Unnamed Spring	2	72	1.8				
Dog Creek	1	160	4				
Miner Creek	13	1,610	40.3	2284	9	475	11.9
Unnamed Spring	2	80	2				
Unnamed Creek	2	230	5.8				
O'Hern Creek	2	240	6				
Eldridge Creek	10	1,030	25.8	2284	4	140	3.5
Pollock Creek	2	100	2.5	2284	1	25	.6
Sulphur Spring Gulch	1	50	1.3				
Unnamed Spring	4	250	6.3				
Cherry Gulch	1	60	1.5				
McAdow Creek	1	All					
Fleshman Creek	23	2,972	74.3	2566	14	767	19.2
Ross Creek	3	480	12	2566	2	90	2.3
Perkins Creek	4	450	11.3	2566	3	310	7.8
Spring Gulch	1	100	2.5				
Unnamed Spring	5	380	9.5				
Dry Gulch	1	160	4				
McGee Creek	1	200	5				
Bowman Creek	1	100	2.5				
Spring Creek	1	500	7.5				
Dry Creek	11	2,010	50.3				
Unnamed Spring	4	420	10.5				
Dry Gulch	1	200	5				
Skunk Creek	1	50	1.3				
Chicken Creek	6	1,280	32	2327	5	165	4.1
Unnamed Spring	2	100	2.5				
Sheep Gulch	0	0	0				
Ferry Creek	10	1,550	38.8	2277	4	261	6.5
Unnamed Spring	5	480	12	2277	1	7	.2
Unnamed Creek	1	100	2.5				
Spring Creek	1	120	3				
Poison Creek	10	1,160	29				
Unnamed Spring	3	200	5				
Shields River Main Stem	64	57,522	1,438.1	2717	103	24,897	622.4
Bennett Creek	2	550	13.8				
Crandall Creek	0	0	0	2717	1	240	6
Lodge Pole Creek	0	0	0				
Spring Creek	2	550	13.8	2717	1	70	1.8
Serrett Creek	0	0	0				
Deep Creek	1	800	20				
South Fork Deep Creek	7	1,220	30.5				
North Fork Deep Creek	7	1,540	38.5				

WATER RIGHT DATA—PARK COUNTY

Appropriations and Decrees by Streams

Stream	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per. Sec.
(Shields River Main Stem) Continued							
Sunlight Creek	0	0	0				
Mill Creek	0	0	0				
South Fork Shields River	12	4,905	122.6	2717	7	1,350	33.8
Logan Creek	2	2,000	50				
Smith Creek	4	1,770	44.3	2717	3	535	13.4
Basin Creek	2	360	9	2717	1	70	1.8
Bain Creek	1	160	4				
Meadow Creek	1	100	2.5	2717	5	655	16.4
Bear Gulch	0	0	0				
Bear Hole Springs	1	100	2.5				
Kavanaugh Creek	4	1,580	39.5	2717	1	40	1
Cottonwood Springs	1	40	1				
Spring Creek	3	1,111	27.8	2717	3	180	4.5
Unnamed Spring	0	0	0	2717	1	160	4
Rock Cliff Spring	1	40	1				
Pine Creek Spring	2	100	2.5				
Porcupine Creek	7	2,380	59.5	2717	9	786	19.7
Unnamed Spring	1	150	3.8	2717	1	65	1.6
Middle Fork Porcupine Creek	5	1,950	48.8	2717	4	390	9.8
Lena Creek	2	210	5.3	2717	7	435	10.9
South Fork Lena Creek	3	660	16.5	2717	6	235	5.9
North Fork Lena Creek	4	570	14.3	2717	3	130	3.3
Middle Fork Lena Creek	0	0	0	2717	1	80	2
Cole Creek	3	600	15	2717	3	340	8.5
Hard-to-Find Creek	1	150	3.8				
Unnamed Spring	3	220	5.5	2717	1	50	1.3
Reservoir Creek	1	100	2.5				
Spring Creek	1	60	1.5				
Unnamed Spring	1	100	2.5	2717	1	50	1.3
Lake Creek	1	200	5				
Smith Gulch	1	200	5				
Elk Creek	4	1,200	30	2717	3	255	6.4
North Fork Elk Creek	16	5,490	137.3	2717	17	2,000	50
Unnamed Spring	1	200	5				
Spring Creek	0	0	0	2717	2	90	2.3
South Fork Elk Creek	6	2,080	52	2717	13	1,430	35.8
Dry Creek	1	300	7.5	2717	6	370	9.3
North Fork Dry Creek	1	160	4				
Daisy Dean Creek	10	2,170	54.3	2717	16	1,275	31.9
South Fork Daisy Dean Creek	1	200	5	2717	2	190	4.8
North Fork Daisy Dean Creek	3	460	11.5	2717	3	415	10.4
Flathead Creek	16	8,006	200.2	2717	30	4,203	105.1
Unnamed Spring	4	470	11.8				
Little Muddy Creek	0	0	0				
Ash, Shaffer or Timber Creek	6	650	16.3	2717	5	470	11.8
Piney Springs	1	20	.5				
Unnamed Spring	2	80	2				
Unnamed Creek	1	200	5				
Spring Creek	1	160	4	2717	1	110	2.8

WATER RIGHT DATA—PARK COUNTY

Appropriations and Decrees by Streams

	Appropriations (Filings of Record)			Decreed Rights			
	No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per. Sec.
(Shields River Main Stem) Continued							
Big Muddy Creek	18	11,605	290.1	2717	14	3,130	78.3
Unnamed Spring	0	0	0	2717	1	20	.5
Spring Creek	3	960	24				
Potter Creek	7	11,510	287.8	2717	2	480	12
Slough	1	100	2.5				
Spring Creek (4N-8E)	0	0	0	2717	2	260	6.5
Sage Creek	1	160	4	2717	1	125	3.1
Alkali Creek	3	275	6.9				
Trout Creek	1	150	3.8				
Bates Creek	0	0	0	2717	2	225	5.6
Unnamed Spring	2	100	2.5	2717	1	100	2.5
Slayton Creek	0	0	0	2717	1	80	2
McMurdo Creek	0	0	0	2717	1	60	1.5
Spring Creek (5N-8E)	5	680	17	2717	1	160	4
Little Cottonwood Creek	8	1,460	36.5	2717	9	1,995	49.9
Unnamed Spring	2	420	10.5				
Waste Water	1	200	5				
Rice Creek	2	100	2.5	2717	2	140	3.5
Horse Creek	3	420	10.5	2717	11	1,110	27.8
Unnamed Spring	1	All					
South Fork Horse Creek	4	720	15.5	2717	5	505	12.6
Basin Creek	1	80	2				
Spring Creek	1	50	1.3				
Middle Fork Horse Creek	2	320	8	2717	1	80	2
North Fork Horse Creek	11	2,880	72	2717	12	1,001	25
Spring Creek	1	20	.5				
Big Indian Creek	5	780	19.5	2717	3	335	8.4
Camp Creek	2	200	5				
Little Indian Creek	9	1,310	32.8	2717	4	270	6.8
Unnamed Spring	1	100	2.5				
Antelope Creek	4	1,155	28.9	2717	6	1,005	25.1
Unnamed Spring	3	340	8.5	2717	1	80	2
Bruckert Creek	0	0	0	2717	1	60	1.5
Dry Creek	0	0	0	2717	1	50	1.3
Looking Glass Creek	7	775	19.4	2717	3	170	4.3
Unnamed Spring	1	40	1				
O'Leary Creek	0	0	0	2717	2	150	3.8
Reservoir	1	500	12.5				
Spring Creek	0	0	0	2717	3	170	4.3
Cottonwood Creek	48	18,095	452.4	2717	42	8,569	214.2
Spring Creek	3	360	9				
Section Creek	1	75	1.9				
Unnamed Spring	5	360	9	2717	3	165	4.1
Pauline Creek	0	0	0				
Slippery Creek	0	0	0				
Lake Creek	0	0	0	2717	3	726	18.2
Little Cottonwood Creek	5	3,160	79	2717	1	300	7.5
Brackett Creek	25	9,795	244.9	2717	26	3,575	89.4
Unnamed Spring	3	160	4				

WATER RIGHT DATA—PARK COUNTY

Appropriations and Decrees by Streams

Stream	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per. Sec.
(Shields River Main Stem) Continued							
Gooseberry Creek	1	50	1.3				
Miles Creek	3	325	8.1	2717	3	180	4.5
Spring Creek	0	0	0	2717	1	75	1.9
Fox Creek	3	360	9	2717	1	100	2.5
Sheep Creek	2	150	3.8	2717	2	250	6.3
Spring Creek	1	40	1				
Spring, Harvey, or Burnt Timber Creek	1	150	3.8				
Catron Creek	1	500	12.5	2717	2	400	10
Canyon Creek	16	3,440	86	2717	18	1,838	46
Rock Springs	1	All					
Unnamed Spring	1	60	1.5				
Elk Horn Creek	2	320	8				
Rock Creek	61	28,182	704.6	2717	82	9,660	241.5
Unnamed Spring	2	200	5	2559	1	75	1.9
Spring Creek	6	810	20.3				
Reservoir	2	4,000	100				
East Fork Rock Creek	1	320	8				
Middle Fork of Rock Creek	0	0	0	2717	1	300	7.5
West Fork Rock Creek	4	300	7.5	2717	1	800	20
Little Rock Creek	0	0	0				
Hammond Creek	2	420	10.5	2717	2	110	2.8
Spring Creek	1	50	1.3				
Cattron Creek	0	0	0	2717	2	50	1.3
Unnamed Spring	0	0	0	2717	1	50	1.3
Chicken Creek	7	770	19.3	2717	10	690	17.3
Unnamed Spring	6	685	17.1				
Bangtail Creek	17	3,660	91.5	2717	21	1,895	47.4
Unnamed Spring	1	160	4	2717	1	50	1.3
Crazy Creek	1	160	4				
Tobin Creek	4	770	19.3	2717	5	390	9.8
Unnamed Spring	2	125	3.1				
Spring Creek	1	50	1.3				
Kay Creek	2	230	5.8	2717	2	60	1.5
Unnamed Spring	0	0	0	2717	1	10	.3
Willow Creek	10	1,970	49.3	2717	10	600	15
Owl Creek Springs	1	110	2.8				
South Fork Willow Creek	7	480	12	2717	4	305	7.6
Unnamed Spring	1	100	2.5				
Bear Creek	1	60	1.5	2717	1	0	0
Middle Fork Willow Creek	5	475	11.9	2717	5	325	8.1
North Fork Willow Creek	7	1,650	41.3	2717	7	570	14.3
Unnamed Spring	4	120	3				
Spring or Fiddle Creek	1	300	7.5	2717	1	125	3.1
Shipton Creek	1	50	1.3				
Falls Creek	9	11,020	275.5	2717	5	772	19.3
Spring Creek	3	285	7.1	2717	2	200	5
Roe Creek	1	60	1.5				
Unnamed Spring	3	240	6				
Blair Creek	2	150	3.8	2717	1	160	4

WATER RIGHT DATA—PARK COUNTY

Appropriations and Decrees by Streams

Stream	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per. Sec.
(Shields River Main Stem) Continued							
Crazyhead Creek	9	1,900	47.5	2717	3	282	7.1
Unnamed Spring	4	240	6				
Adair Creek	7	1,200	30	2717	9	605	15.1
Beaver Creek	1	150	3.8	2717	1	150	3.8
Unnamed Spring	1	160	4				
Spring Creek	2	250	6.3				
Sheep Creek	2	400	10				
Bull Run Creek	4	820	20.5				
Noel Creek	1	100	2.5	2717	1	50	1.3
Palmer Creek	0	0	0				
Anderson Creek	1	100	2.5				
Grannis Spring Creek	1	100	2.5				
Short Creek	1	100	2.5				
Unnamed Springs (Not Located)	17	1,131	28.3	2717	1	All	
Waste Water (Not Located)	2	380	9.5				
Reservoirs (Not Located)	3	4,500	112.5				
Tent Creek	1	50	1.3				
Mission Creek	35	16,870	421.8				
Reservoir	1	80	2				
Unnamed Spring	1	100	2.5				
Spring Creek	1	20	.5				
Mill Creek	2	300	7.5				
Frank Baker Logging Creek	1	100	2.5				
Tie Creek	0	0	0				
Little Mission Creek	3	320	8				
Redfield Creek	1	80	2				
Middle Fork Little Mission Creek	1	200	5				
Unnamed Springs	4	1,590	39.8				
Rock Creek	1	50	1.3				
Spring Creek	3	250	6.3				
Cabin Gulch	1	100	2.5				
Gooseberry Creek	2	260	6.5				
Beaver Creek	18	1,730	63.3				
Unnamed Spring	3	120	3				
West Fork Beaver Creek	2	230	5.8				
South Fork Beaver Creek	1	160	4				
North Fork Beaver Creek	1	100	2.5				
Antelope Creek	1	160	4				
Water Creek	1	120	3				
Spring Creek	1	160	4				
Work Creek	3	250	6.3				
McCurdy Creek	1	40	1				
Hutter Creek	1	120	3				
Unnamed Spring	3	170	4.3				
Spring Creek	2	280	7				
Locke Creek	3	90	2.3				
Unnamed Spring	2	All					
Davis Lake	1	80	2				
Nelson Lake	1	160	4				
Basin Lake	2	320	8				

WATER RIGHT DATA—PARK COUNTY

Appropriations and Decrees by Streams

Stream	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per. Sec.
(Continued)							
Cady Coulee	0	0	0				
Unnamed Spring	1	40	1				
Beaver or Greeley Creek	8	855	21.4				
Greeley Springs	1	50	1.3				
Peterson Creek	1	40	1				
Mendenhall or Sheep Creek	1	All		3163	3	240	6
Cottonwood Creek	1	60	1.5				
Hunters Creek	1	All					
Unnamed Spring	1	4	.1				
Unnamed Springs	3	25	.6				
Mendenhall Springs	1	4	.1				
Dog Creek	3	100	2.5	2577	2	All	
Hunters Hot Springs	1	All					
Cold Spring or Cottonwood Creek	2	600	15				
Lillie Spring	1	100	2.5				
Duck Creek	0	0	0				
West Fork Duck Creek	8	4,970	124.3	236	8	2,950	73.8
Alder Creek	2	520	13				
Unnamed Spring	5	570	14.3				
Cayuse Creek	0	0	0	236	1	80	2
Hole-in-Rock Creek	1	200	5	236	1	100	2.5
Wilcox Creek	2	400	10	236	1	200	5
Lowell Creek	2	260	6.5	236	1	100	2.5
Lilley Creek	1	50	1.3				
Antelope Butte Creek	2	250	6.3	236	1	80	2
East Antelope Butte Creek	0	0	0	236	1	40	1
North Antelope Butte Creek	0	0	0	236	1	40	1
Kenney Creek	1	320	8				
Boulder River	0	0	0				
Unnamed Springs	3	83	2.1				
Spring Creek	2	250	6.3				
Elk Park Creek	1	500	12.5				
Silver Mountain Creek	1	1,000	25				
Copper Creek	1	500	12.5				
Elk Creek	1	400	10				
Upside Down Creek	1	All					
Stuby Creek	1	20	.5				
Silver Creek	1	200	5				
Four Mile Creek	1	20	.5				
West Howley Creek	1	50	1.3				
Great Falls Creek	4	5,500	137.5				
Falls Creek	17	5,090	127.3				
Froze-to-Death Creek	9	11,668	291.7				
Cowan Creek	1	4	.1				
West Boulder River	29	62,390	1,559.8				
Unnamed Springs	10	550	13.8				
Basin Creek	6	3,000	75				
Davis Creek	0	0	0				
Grouse Creek	4	480	12				

WATER RIGHT DATA—PARK COUNTY

Appropriations and Decrees by Streams

Stream	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per. Sec.
(Boulder River) Continued							
Spring Creek	1	120	3				
Unnamed Spring	2	320	8				
Sheep Creek	1	160	4				
Hough Creek	1	50	1.3				
Tedrick Creek	1	100	2.5				
Spring Creek	2	600	15				
Nuttal Creek	1	250	6.3				
Fouts Creek	1	200	5				
Snow Creek	2	300	7.5				
Unnamed Spring	1	All					
Elges Creek	0	0	0				
Stillwater River	2	712	17.8				
Unicorn Creek	1	50	1.3				
Sluice Creek	1	300	7.5				
Goose Lake	1	2,000	50				
Goose Creek	1	All					
Rosebud River	0	0	0				
East Rosebud River	0	0	0				
Granite Creek	1	400	10				
Clarks Fork River	13	118,530	2,963.3				
Crown Butte Creek	1	500	12.5				
Burke Lake	1	3,000	75				
Broadwater Creek	4	126,000	3,150				
Alice Creek	2	114	2.1				
Lakeview Creek	1	4,000	100				
DRAINAGES IN YELLOWSTONE RIVER BASIN NOT LOCATED:							
Balin Gaylord Creek	1	150	3.8				
West Henderson Creek	1	All					
Ingersoll Creek	1	All					
Isintrout Creek	1	160	4				
Pine Creek	3	110	2.8				
Seward Creek	5	4,100	102.5				
Spring Creek	16	2,519	63				
Thurston Creek	1	200	5				
Troutman Creek	1	1,000	25				
Fountain Claim Tunnel	2	50	1.3				
Horse Shoe Lake	1	300	7.5				
Iceberg Spring	1	200	5				
Unnamed Springs	30	2,723	68.1				
MISSOURI RIVER BASIN							
Missouri River	0	0	0				
Gallatin River	0	0	0				
East Gallatin River	0	0	0				
Rocky Creek	0	0	0				
Middle Creek or Jackson Creek	4	386 2/3	9.6				
TOTAL	2,044	2,844,259	71,106.5		1.087	131,910	3,297.8